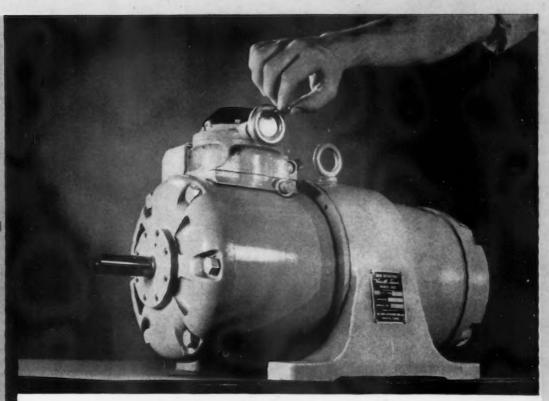
MARCH 12, 1936

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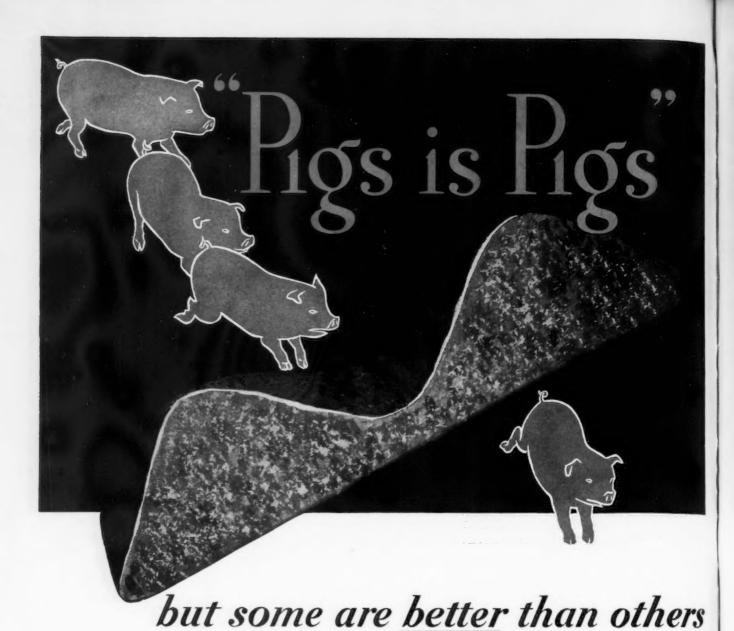


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2—THE IRON AGE, March 12, 1936

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Contents - March 12, 1936

Keep the Hogs Out of the Corn Crib	9
A Profitable Fire	2
Car Axles Machined Rapidly With Modern Equipment 36	6
What Is Really Behind Machine Tool Improvement 4:	2
Going Up 4	5
Finishing Manganese Steel Parts by Grinding 4	6
First Butane-Electric Switching Locomotive	3
Automotive Industry 56	6
Here, There and Everywhere	0
Washington News	2
News	4
Rate of Activity in Capital Goods	9
Statistics on Metal-Working Activity	0
Markets 9	1
Construction and Equipment Buying	4
Products Advertised	3
Index to Advertisers	6

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Bethlehem makes a complete range of fine die steels, among which one can be found to meet ideally the requirements of each class of service. Three grades of carbon tool steel, known as X, XX and XCL, cover all requirements for water-hardening die steels.

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THE IRON AGE

MARCH 12, 1936

ESTABLISHED 1855

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Vol. 136, No. 11

Keep the Hogs Out Of the Corn Crib

HEN the hogs break into your corn crib, it is good-by corn. The hog doesn't know when to stop, nor does he care whether or not he puts the farmer—and eventually himself—out of business by destroying the reserve supply of food. All the hog is interested in is his immediate bellyful.

The appetite of an extravagant administration for new tax sources is as blind and unreasoning as is the hog's appetite for corn. Having exhausted the possibilities of taxation on income and earnings to the limit of present pre-election expediency, the tax gatherer is now turning his covetous eyes toward the "corn cribs" in which American business keeps its savings. Hitherto we have kept savings, both corporate and personal, immune from the tax hog. He has been permitted to gobble up more than his share of replaceable current income but not to eat into the rainy day savings.

And that, in stark actuality, is what the Administration now proposes to do in its plan to seize a sizable percentage of all corporate surpluses.

WHAT is a surplus? Many people make the mistake of thinking that it is cash in bank or securities hoarded in strong boxes. It is not. Most of it is in bricks and mortar and machinery. Any business which has financed its expansion out of earnings instead of through selling stock or issuing other securities must enter the value of these improvements in its surplus account. The best part of American industry and American employment as well is built out of earnings rather than out of Wall Street negotiations.

Take the case of the Ford Motor Co. The value of its property in plants and equipment in Detroit and throughout the length and breadth of our country would stagger one's imagination. All of this, except for the original investment of \$55,000, was built by plowing back earnings. Thousands of smaller concerns in our country have developed their plants and their employing power by adopting this "pay as you go and build as you earn" policy. Corporate surpluses such as these have been the yeast that has made America grow.

Not only have they made us grow but they have kept us safe. If the tax hog had gotten his hungry snout into our corporate corn cribs before the depression, it would have been "just too bad" for all of us. For out of these "surplus" corn cribs during the five years of the depression came \$27 billions to keep industry going. Imagine the state of unemployment that would have obtained had industry, during that time, been unable to spend \$27 billions more than it produced in income. If these surpluses had not been kept inviolate, Uncle Sam would have had to pay out \$37 billions for relief and made work, instead of the \$10 billions that he did pay out during the same period for those purposes. And the national debt, by this time, would have been above even the \$50 billion limit which the unknown banker set for the President.

THIS proposal to penalize thrift by seizing savings is so opposed to American procedure and so fraught with danger to the American public that every citizen, and particularly every member of Congress, should know all about it before he consents to stick his head into its noose. Unfortunately, the average man sees the arrow piercing only the employer and does not realize that its force carries it also through every man, big or little, who stands back of him.

People with pay envelopes will be the chief losers if this newest "rabbit from the hat" runs the gauntlet of Congress and emerges from the Capitol unscathed. Incorporated companies afford the larger part of all American employment. If we must abandon the American plan of expanding our plants and employment out of earnings; if surpluses, which are the yeast of our industrial growth, are to be emasculated or handed to politicians to play with, there will inevitably be fewer jobs in good times and very probably no jobs in bad times.

Let's look into the "corn crib" of American business by examining the net surplus of all incorporated business. For the benefit of Congressmen who may wish, this time, to form their own opinions instead of accepting dictated ones, attention is called to table 190, Assets and Liabilities of Corporations, on page 188 of the "Statistical Abstract of the United States for 1935." Here we find that by the end of 1932 America's 451,884 incorporated concerns had accumulated an aggregate net surplus of \$36 billions, of which \$15.9 billions were in cash. This ratio of cash surplus to total surplus was highest in 1932 because the total had become so sadly diminished through depression losses, having dropped from \$55 billions in 1929. Normally, as the records will show, the amount of cash in aggregate surplus does not reach more than 1/3 of the total.

Simple division of the total 1932 net surplus and of the cash surplus of all corporations by the total number of corporations reporting shows an average net surplus, per corporation, of \$79,663 and an

average cash surplus of \$35,185. This average, modest as it is, was not the result of undivided profits in 1932—it was the total corn that business had been able to store up in its crib after years of thrift. The entire business backlog for fighting depressions and weathering hard times, as well as the total working capital.

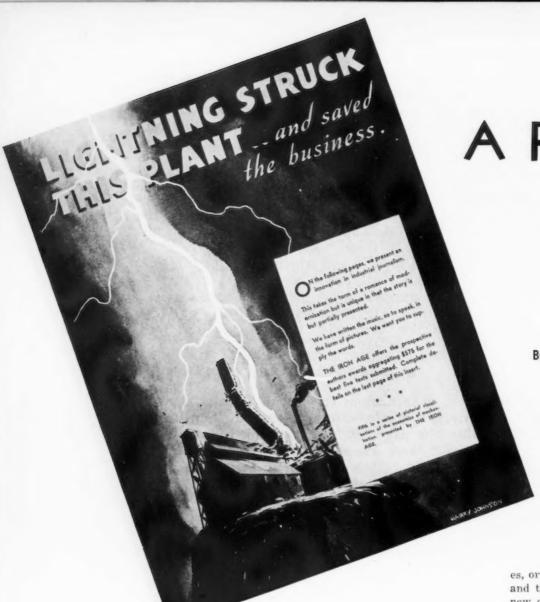
F course, the present surplus-taxing proposal is not supposed to apply to these accumulative totals. That is the story today; tomorrow it may be something else again. The idea in mind at the moment is to seize a goodly percentage of those "undivided profits" which will be the result of operations in 1936 and which would be carried into surplus in 1937, with similar procedure, year after year thereafter. The President, in recommending his plan to Congress states on Treasury authority that there will probably be a surplus of \$4.5 billions of undistributed income "withheld" from stockholders for the calendar year of 1936.

F this be true, it will be a miraculous reversal of form as shown by long term experience. Again referring to the "Statistical Abstract for 1935," table 186, page 186, "Corporation Income Tax Returns, etc.," we find that there has not been a single year, even during the height of prosperity, when any such amount of income earned by corporations has been withheld from stockholders. As a matter of fact, taking the ten-year period from 1923 to 1932 inclusive into account—good years and bad—the total cash dividends paid to the stockholders in our corporations have actually exceeded, by \$4 billions, the total net profit earned during this period by these corporations.

Some stockholders may imagine that they will benefit from the compulsion of companies to increase dividends by disgorging surpluses. Where there is one who will profit, there are thousands who will suffer, for corporation surpluses, which almost invariably include all working capital, are none too large. It requires a very sizable surplus to carry a steel company, a motor manufacturer or any other large concern over a bad quarter. Speculators may profit, but investors will suffer not only from the weakening of their companies but because of irregularity of dividends. Today your stock pays \$5 per share and sells for \$100; three months hence with dividend dropped the price falls to \$30.

Thas been well said that the power to tax is also the power to destroy. The formulation of a new departure in taxation is, at best, something that cannot be safely dashed off on the political spur of the moment and jammed through a subservient legislature for pre-election purposes. It is something that should be approached with deliberation, careful study, fasting and prayer; a prayer particularly that the tax hogs may be kept out of our corn cribs.

At Vausoeuty



A Profitable

Fire

By CLARENCE G. RUSH

THIS is one of the prize-winning articles in our "Struck by Lightning" competition which was staged to accompany the recent Machine Tool Exposition. Previous winning papers were published in The Iron Age of Nov. 28, 1935, and Dec. 12 and Feb. 13 of this year.

These stories, which present facts in the palatable form of fiction, have had a splendid reception from our machine tool-using readers. They have been of material help in securing acceptance of the profitable advantages of modernization.

"MORNING JIM, how goes it?" said young Jack Farley, to the night foreman at the Farley Products Company's plant.

"Rotten," returned Jim. "The old war horse broke down last night and we lost three hours repairing

it, held up four men on the drill presses waiting for material, then just as we got the war horse started we threw a belt off of the drill presses. Gee, wish we could only get a multiproduction lathe in place of the "war horse" and individual drives on the drill presses, or better still, new drill presses, and the Lord knows we sure need new ones."

"Kind of unloading, aren't you Jim?" asked Jack.

"Sure am," said Jim, "And I think it is about time some one did before the whole plant falls apart."

Jack knew the foreman was right, and he had been trying to pound these things into his father's head and the other stockholders' heads for the last four years. He knew that they were running with obsolete equipment and were not fitted to compete with the "Progressive Manufacturing Co." who were located just below them on the same street. He had been in their plant and knew what they were doing, and how they were doing it, and it was driving him crazy to try and meet such competition with antique and obsolete equipment.

The directors couldn't see it, and always answered his requests for new equipment with; "We are an old-established firm and have always met the keenest competition with this plant, and we can see no reason for you to jump in here



"YOUR plant is on fire," came a voice on the phone. "Looks as if it will be a complete loss."

fresh from college as factory superintendent and ask us to remodel our entire plant to satisfy your youthful modern ideas."

"Well, wait and see," answered Jack. "Some day this Progressive Manufacturing Company will have all of our business and all we will have it our old-established name."

That night as Jack was leaving, dead tired from running down broken parts, ordering patterns for repairing worn-out machinery and trying to figure bids, based on costs using out-of-date equipment against modern factory methods, Jim, the night foreman, stopped him to remark: "Looks like we are going to have a big electrical storm."

"Couldn't be any worse than the brain-storm I have been having to-day," answered Jack. "Try and hold that bunch of model 'B's' together tonight and I will see what can be done about repairing them tomorrow."

Jack was awakened about 12.30 a.m. that morning by the incessant ringing of the phone.

"Your plant is on fire, lightning struck that bunch of old sheds at the rear. Looks like it will be a complete loss," came over the phone.

The next day at a hurriedly called directors' meeting in the sample room of the local hotel, Jack was called on to bring in his foremen, master mechanic and the sales manager.

Everything was jumbled up. One stockholder wanted to go out of business, another wanted to buy up an old plant that was for sale in a nearby city. Jack's father, president of the company, turned to his son and asked him for his ideas on what they should do.

Jack turned to the sales manager and said, "Mr. Hurley, please tell these gentlemen what you have been telling me for the past two years regarding our old plant."

The sales manager told his story briefly: "With all the competitors that we have, who are equipped with the latest in modern machinery, we have been able to secure but 25 per cent of the business that we should. My cry to Jack

tinued. "Gentlemen, allow me to present Mr. Albert Jensen, representing the Up-to-Date Machinery and Equipment Company, who will tell you how we can cut production costs by the installation in our new factory of new and modern production machinery."

"Gentlemen," began Mr. Jensen,
"I have been working on Jack for
the last two years, telling him he
should burn or destroy all of his
old, obsolete equipment and put in
late model, real precision production machinery. Now, gentlemen,
just that thing has happened, and
your chance has come to rebuild



HE next day, there was a hurriedly called directors' meeting at the local hotel.

has been: Why can't we meet these prices? He has always answered me that with the machinery and equipment that he has that we are producing at a cost as low as humanly possible, and what he needs is new and modern equipment such as our competitors have."

"That is the story," said Jack.
"I believe this fire has been a godsend to us. We can now rebuild,
and equip the new plant with all
new and modern equipment. I
know our insurance will not cover
anything like this but whatever we
invest in this new plant I will
guarantee will be well spent.

"I have here a gentleman who can tell you better than I can about modern manufacturing," he con-



"Our machinery was ready for the scrap heap anyway," said the superintendent.

and install this equipment and really go out after competition.

Jack's father smiled his approval of Mr. Jensen's frank statement, and said, "Mr. Jensen, please outline briefly your suggested plan of equipment in our new factory and the savings in manufacturing costs that we will be able to make over the costs we have had in our old plant."

"I will briefly outline one change that I have recommended to Jack. This is typical of what you may expect in the way of savings all along the line.

"I have figures here on the fourinch cast iron wheel that you make and use by the thousands. As I understand it, you use approximately 30,000 of these wheels a year. At present you are machining them on an old model Turret Lathe at the rate of 10 per hour and operating 24 hours every working day. At that rate, figuring 250 working days per year you are only producing wheels about half of your time, the balance of the time must be consumed in changing tools and making repairs. Your cost is based on running 10 wheels per hour. At 24 hours per day you should produce 240 per day which multiplied by 250 working days would be 60,-000 wheels per year. In reality you only produced and used 30,000 of these wheels; therefore, your cost should have been based on 5 per hour. Your natural thought is that when it is running along all right you can make 10 per hour. but, gentlemen, these figures prove



"WE have been able to secure only 25 per cent of the business that we should," said the sales manager, "because our competitors had modern machine tools.



DIRECTOR PINCHPENNY, who was an old school conservative, suggested that the company fold up and go out of business.

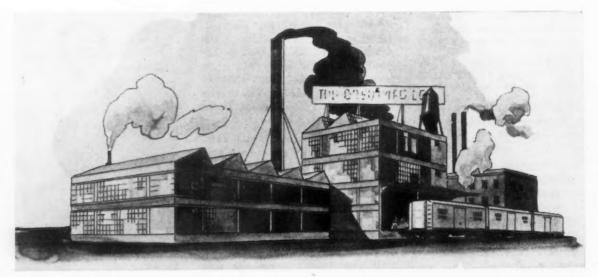
that you must be using over onehalf of your time in making repairs.

"I have our figures of machining this wheel on our late model Multiproduction lathe. We can guarantee three minutes per wheel or 20 wheels per hour and 24 hours per day without costly shut-downs such as you have been having. We are guaranteeing one wheel every three minutes, and I know that Jack will be able to better our figure. Your sales should jump up so that you will be able to use twice as many of these wheels this year, and remember, this Multiproduction lathe can also be used on other jobs in your plant."

Two weeks later another meeting of the stockholders was called. This time every one was excited and thrilled over the prospect of a new, modern plant to be built over the ashes of the old plant.

Mr. Farley began the meeting with a review of the Machine Tool Exposition: "Gentlemen," he began, "I am unable to express my surprise at the gigantic showing of latest models of production machinery that we saw at the exposition. I did not realize we were so far behind the times with our old plant and, believe me, gentlemen, I am glad our old plant burned down and brought us to a showdown on our old, obsolete equipment. We saw equipment there that was almost human in its actions.

"We have outlined the equipment we will need to equip a new plant and also the savings over our old methods of manufacture. This new equipment will cost us thousands of dollars, but I can assure



"T:HINGS are moving like clockwork in this new plant," said the night foreman. "We haven't missed a beat since it started."

you that it will pay for itself many times over. Our products are in demand and our old established name is an asset to us and, with this new equipment, I can see no reason why we shouldn't take the field this coming year.

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"Now, gentlemen, my son will outline some of the new equipment."

Jack arose, all smiles, and began his outline of equipment with all the enthusiasm of a fisherman who has been allowed to take his pick in a sporting goods store.

"Gentlemen, we have, with the help of Mr. Jensen and the engineers of his company, figured a complete set-up of equipment necessary to make our plant the most up-to-date manufacturing plant in

the country in our line. This equipment includes: automatic high-speed presses and dieing machines, automatic screw machines, broaching machines, drill presses, hydraulic punch presses, cranes, trucks, steel tables, benches, correct grinding equipment and all the tools necessary in a modern manufacturing plant.

"Here, gentlemen, is the complete list with the first costs and the comparison of manufacturing costs between our old methods and the new low-cost figures."

After a deliberate study of the plans and figures a vote was taken and work was started immediately on the modern factory.

Scene six months later:

Young Jack Farley jumped out

of his car and opened up the office. As he walked out into the plant he is greeted by Jim, the night foreman.

"Good morning, sir. It sure is a pleasure to run this plant now, Jack. Things work like a clock and we haven't missed a beat since we reopened."

"Makes me feel great to hear you say that, Jim," returned Jack. "And business has picked up over 100 per cent, which accounts for the generous increase in salaries that we made the first of last month. Well, I must get to work and get the orders lined out for the day. It certainly is a relief to be outlining orders instead of superintending repairs to worn-out machinery!"

Stainless Coatings by an Improved Chromizing Process

MPROVEMENTS in the process of chromizing, which it is claimed will vastly increase its usefulness, have been announced by Cooper Products, Inc., Cleveland, Ohio, a research organization. This new process is being tested by a leading steel producer with a view to applying it commercially. Sheets, strips, wire, and other shapes having a stainless steel surface and a simple steel core, may soon become available to industry as a result of these improvements.

Chromizing was originally developed and patented by Floyd C. Kelley for the General Electric Co. Cooper Products, Inc. has conducted an extensive research to improve the method, and has also acquired the original Kelley patent. Chromizing is a cementation process, similar to case hardening, calorizing, and sherardizing, except that it employs chromium, whereas the former use carbon, aluminum, and zinc respectively. It can best be applied to mild steel and consists of packing the steel in chromium powder and other compounds, and heating for several hours at temperatures above 1850 deg. Fahr., depending on the results desired.

Originally chromizing had to be done in hydrogen, which limited it virtually to laboratory type equipment. One of the improvements announced does away with the hydrogen and makes it possible to use ordinary commercial types of furnaces. Another improvement consists of the chromizing of billets or other semi-finished products, and then rolling them into sheets, strips, wire, etc., which retain a stainless steel surface.

As applied to mild steel, the process produces a shell or casing of ferro chrome containing 25 per cent to 30 per cent chromium. This is a type of stainless steel, and the chromized surface is claimed to have all the desirable properties of that material. A casing 0.080 in. thick can be produced in 8 to 10 hours at about 2400 deg. Fahr., and a thicker casing after longer treatment it is claimed. Such casings are suitable for billets that are to be reduced to finished steel. On finished products such as stampings, etc., a casing about 0.005 in. thick can be produced in one to two hours at about 1850 deg. Fahr. The casing penetrates the original metal and does not appreciably alter the size of the treated piece. It is believed that the process will be especially applicable to treating deep drawn pieces that are difficult to make out of solid stainless steel.

Chromizing can be applied to special alloy steels, such as those having high temperature strength. In this way, it is stated, the special and desirable properties of the core steel can be combined with a stainless surface. It is believed that at first chromized steel will find an application in non-competitive fields where it can supply a combination of properties not now available. Ultimately it is believed it has the possibilities of displacing stainless steel in many applications on the basis of price, and perhaps also competing with other materials such as tin plate for food packing,

On a large scale the cost of chromizing is expected to be in the same range as that of case hardening, and it is believed that ultimately chromizing will add only about 4 cents per lb., factory cost, to the cost of the chromized article or material.

The finish of pieces as they come from the chromizing furnace is slightly rough, and slightly dull, but not oxidized. The surface may readily be buffed to a high polish.

Cooper Products, Inc., is exclusively a research organization and has no manufacturing facilities. By cooperation already under way with a leading steel maker it plans to put chromized sheets, strips, wire, etc., on the market. It also plans to license the chromizing of finished parts to manufacturers for their own work or to processors for industry generally.

Car Axles Machined Rapidly by Modern Equipment

By M. M. McCALL



AMONG the recent noteworthy improvements in machine tools is the equipment devel-

oped for the rapid machining of car axles from the forgings.

The forged axle is shown in the foreground in Fig. 1. The first operation is to cut off the rough ends to the proper length, and center the axle. During this operation about 2 in. of each end is rough-formed, as shown on the axle in the center of Fig. 1.

The first operation is performed on the axle centering and cuttingoff machine, shown in Figs. 2 and 3. The axle forging is supported on the center rest and is raised to the center of the machine. Right and left-hand driving heads, which are integral with the carriages, are adjusted laterally along the bed by means of air cylinders, and are positioned by positive stops to suit the length of the axle. The driving heads are rotated from a splined driving shaft in the bed, which is driven by a 50-hp., 4-to-1 adjustable-speed motor.

Each driving head has three serrated driving jaws which may be changed to suit different sizes of axles. One jaw is mounted on a holder which has tangential adjustment to clamp the axle in the driving head. The adjusting screw is driven by a torque motor mounted on the head, the drive being transmitted through a socket connection. The driving heads are stopped in the proper position so that the socket connections on the rotating and stationary members register with each other. The connection is made by pressure on the handle on top of the head. A spring causes the handle to return to its normal position when the

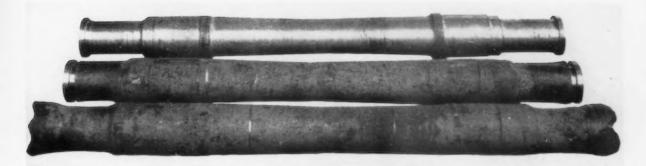
pressure is removed, insuring that the socket is disconnected at all times except when clamping or releasing the axle. The clamping jaws are mounted on tapered surfaces so that they will wedge themselves against the axle and bite deeper into its surface as the cut increases.

Part of Ends Rough Formed

When the axle is clamped in the driving heads the center rest is lowered from contact with the axle. Front and rear tool blocks are provided on the carriages, each carrying a cutting-off tool, as shown in Fig. 3. A blade tool is positioned adjacent to the cutting-off tool so that about 2 in. of the axle is rough-turned simultaneously with the cutting-off operation. The movement of the cutting-off tools toward and away from the work is by means of a right and left-hand screw.

A feed box in the center of the machine provides three feeds to the tool blocks. The feeds are driven

36-THE IRON AGE, March 12, 1936



F!G. I.—In the foreground: axle forging; in the center: axle with ends cut off and centered, and collars and parts of journals rough turned on each end; in the rear: axle rough turned all over.

from the driveshaft in the bed. Rapid power traverse to the tool blocks is obtained from a motor mounted on the right-hand end of the bed. The motor rotates the feed shaft which extends along the front of the bed. Feed or traverse is selected by a lever on the feed box which interlocks the feed with the push-button station for the traverse motor.

The speed of the main driving motor is controlled through a field rheostat connected with the tool slides, so that the motor is automatically speeded up as the tools move toward the center, thereby providing a constant cutting speed.

Centering heads are mounted on columns at the rear of each of the carriages. The heads are normally above the axle, and vertically adjustable by means of air cylinders. Two spindles are carried in each head. They have lateral movement by air cylinders and are rotated by ¾-hp. vertical motors. The lower spindle carries a center drill, and

the upper spindle a countersink drill. The spindles are brought simultaneously into their proper sequence of operation by moving the heads up and down on the vertical slides by means of an air valve located on the left-hand head. When desirable, the center and countersink drills may be combined in one tool, in which case only one spindle is required in each head.

Axle Rough Turned on Heavy Lathe

After the axle has been centered it is rough-turned on the heavy roughing lathe, shown in Figs. 4 and 5. The rough-turning operation consists of turning all the surfaces of the axle during one chucking, except the collars on each end, which were turned simultaneously with the cutting-off operation and are used to chuck the axle during the rough-turning operation. The rough-turned axle is shown at the rear in Fig. 1.

The roughing lathe is driven by a 100-hp., 4-to-1 adjustable-speed motor which rotates the chucks on both headstocks by means of herringbone pinions and gears. The left-hand headstock is securely fastened to the bed. The right-hand headstock is adjustable on the bed by two air cylinders. The speed is controlled through Curtis regulating valves. When in the working position, the air in the cylinders is trapped so that the headstock cannot slip back through failure of the air supply.

An automatic chuck is bolted to the bell chuck formed by the end of each spindle. The chucks consist of three jaws sliding in tapered seats. The jaws fit in an annular groove in a central plunger which has a projection, the end of which comes in contact with the end of the axle. The jaws are closed by the lateral pressure of the axle against the plungers. The pressure is the result of the traverse of the right-hand headstock into



FIG. 2.—Axle forging in loading position on centering and cutting-off machine.

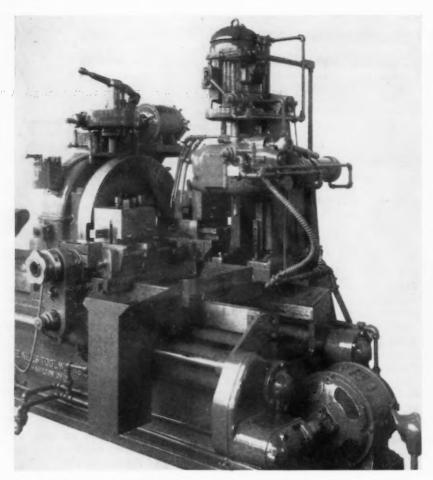


FIG. 3.—Close-up of right-hand carriage on centering and cutting-off machine. Centering head, front and rear tool holders, and chucking mechanism are shown.

the working position. The outer ends of the jaws are provided with tips having a cross taper so that as the torque increases in the axle, the tips slide up the taper and grip the axle proportionately tighter. The left-hand headstock is provided with an air-operated axle discharging device to push the axle

loose from the jaws after the right-hand headstock has been traversed to the unloading position.

Carriages Have Hydraulic Feed

Two carriages are provided, each having independent hydraulic feed

and traverse along the bed. A tool slide is mounted on the outer end of each carriage having hand cross adjustment. Multiple tool holders are provided for tools to turn the journal and other straight surfaces on both ends of the axle. Aprons are bolted to the inner end of each carriage having cross slides on which are mounted multiple tool holders. The tools for turning the tapered portion of the axle are mounted in these tool holders. As each carriage is fed along the bed hydraulically, a rack pinion on the apron is rotated by a fixed rack on the bed. This rotary motion is transmitted by change gears to the screw which moves the cross-slide across the apron. The change gears are of suitable ratio to cause the tools to be fed crosswise in the right proportion to the longitudinal movement of the carriage to cut the required taper on the axle.

Fig. 6 shows the arrangement of the tools on the right-hand carriage for roughing the right-hand part of a 51/2 x 10-in. axle. The chuck jaws grips on the 634 x %-in, collar which was roughed on the centering and cutting-off machine together with part of the 5%-in. rough journal. Tools 1, 2, 3 and 4 are mounted in the tool holder on the carriage, and tools 5, 6 and 7 are in the tool holder on the apron which is fed crosswise simultaneously with the carriage longitudinal movement to turn the tapered surface. The tools are set by gages so that when tool No. 1 has reached the end of its cut on the journal and the carriage feed is tripped, the other tools will finish the cut on their respective surfaces. As the tapered surface is longer than

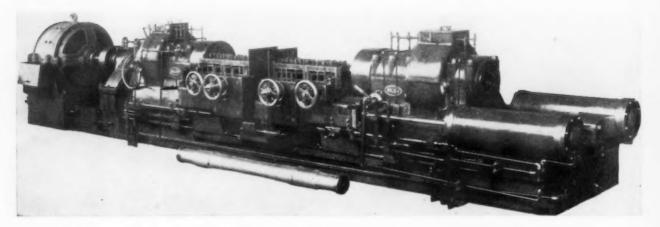


FIG. 4.—Powerful roughing lathe which rough turns the axle while it is chucked on the two collar surfaces.

the length of cut required for the journal, three tools are used, each one roughing a part of the surface.

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As the carriages are fed their required amounts, all surfaces on the axle are roughed with the exception of the 6 x 6-in. section in the center. This is then roughed by tool 7 on one of the carriages with the cross feed thrown out. The carriages are guided on the

axle to be loaded and unloaded from the right-hand end when moved in and out on an angle. The left-hand tailstock center has no adjustment, and when the axle is centered at the left-hand end, the right-hand tailstock center is adjusted into the center hole in the right-hand end of the axle.

Three driving jaws with serrated faces are pivoted in the drivon the surface of the axle. It is driven by four square drivers in the driving spindle which are fitted in rectangular slots in the driving plate. The slots are arranged at right angles to each other, permitting motion of the driving plate in two directions. Springs insure enough friction between the driving plate and spindle for efficient operation, and also overcome the effect of eccentric weight when the driving plate is off center.

Each carriage has a multiple tool holder for four tools which are arranged as shown in Fig. 8. As tool No. 2 finishes the journal, tools 1, 3 and 4 will finish the collar, dust guard and wheel seat, respectively. Trips are provided which may be set to trip the feed of the carriages at the proper time by opening a split nut on the feed screw. The feed screw has right and left-hand threads so that both carriages are fed toward the center.

A lathe of this type is suitable for rough-turning operations on the ends of axles, and also for reconditioning worn axles. It is a popular machine in many railroad shops for reconditioning operations and for finish-turning the axles which are purchased from the man-

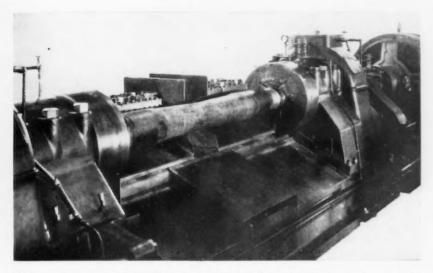


FIG. 5.—Rear view of roughing lathe showing how rear bed way is cut away opposite carriages to facilitate disposal of chips.

front way of the bed, the rear bedway opposite the carriages being cut away as shown in Fig. 5 so that the chips will readily fall out of the bed into a pit.

Finish-Turned on Center Driven Lathe

As it is not necessary to finish turn the center portion of the axle between the wheel seats, the finish turning operation is performed on a center driven lathe. The center driven axle lathe shown in Fig. 7 is equipped with special features to increase its productive capacity. An automatic equalizing driving head rotates the axle, and multiple tool holders on each carriage finish all of the surfaces on the ends of the axle with one feed movement of the carriages.

A 25-hp. motor at the end of the lathe rotates the center driving spindle, the final drive being by herringbone gears. The driving head has a large enough hole through its center to permit the

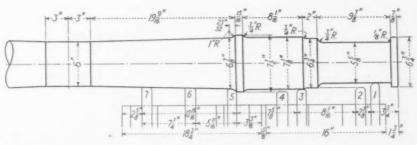


FIG. 6.—Arrangement of tools on right-hand carriage of roughing lathe to rough turn a $51/2 \times 10$ in. axle.

ing plate. They may be swung into contact with the axle, or out of the way when loading or unloading, by gear teeth on the outer surface in mesh with the teeth on a large internal gear. The internal gear is rotated by a bar inserted in holes on its outside diameter, through the cored slots in the driving plate. The driving surfaces of the jaws are arranged so that as the torque increases, the teeth will grip proportionately tighter. The driving plate is free to float to equalize any inequalities

ufacturer in the rough-turned condition. When not equipped with the automatic equalizing driving head, an equalizing plate is furnished with projections to contact a driver dog which is attached to the axle before it is placed in the lathe. Poppet tool posts, or fourway turrets may be substituted for the multiple tool holders.

Separate Burnishing Lathe

The journals on the axles are often burnished on the finishing

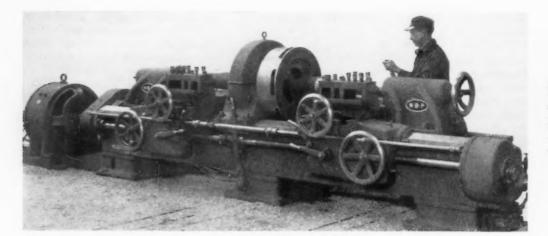


FIG. 7.—Center driven axle lathe with automatic equalizing driving head and multiple tool holders for operations on ends of axles.

lathe by substituting the burnishing roller in place of the turning tool, or by providing a special holder for the burnishing roller on the rear of the tool slide. Owing to the pressure applied to the burnishing roller, the burnishing operation is a severe one to be performed on a finishing lathe. It has proven more satisfactory to perform the burnishing operation on a separate burnishing lathe designed especially for the purpose. In shops where axles are produced in large quantities, the separate burnishing lathe is decidedly popular. One burnishing lathe will burnish the axles finished on a battery of three finishing lathes.

A car-axle burnishing lathe is shown in Fig. 9. The machine is driven by a 5-hp. constant-speed motor. No speed change box is necessary, as one rotating speed to the axle is sufficient. The driveshaft in the bed is driven through a double gear reduction on the end of the bed. The driving pinion on this shaft is positioned so that it will mesh with the gear on the

chuck when the axle is gripped on its right-wheel seat. The chuck is quick acting and self-centering, with three jaws. The main castings are made of baush material, and the chuck is so small that it is easily handled.

Operation of Chuck

The chuck is slipped over the right-wheel seat of the axle just before the axle is lowered between centers. When the axle is centered between the two simple tailstocks the gear on the chuck is placed in mesh with the driving pinion and the jaws are closed on the wheel-seat of the axle. This is accomplished by rotating the two main parts of the chuck in opposite directions with two bar wrenches, one in each hand, placed in holes in the castings. The inside casting contains the slots in which the jaws are held in a position pointing toward center. The outside casting, on which the gear teeth are cut, has three eccentric surfaces covered with hardened

strips, which serve to push the jaws toward center when the two castings are rotated in the proper direction with respect to each other. Since the wheel seat is a turned surface, the chuck will run true. As the chuck is driven by the outside casting, the harder the axle holds back, the more the eccentric creeps under the jaws and forces them to grip the axle. A small spring wire in the center of the chuck keeps the jaws back against the hardened surfaces when the jaws are opened. Three sizes of chucks are required to cover the usual range of axlewheel seat diameters. The gear teeth on the driving chuck are covered with a removable cover.

Two carriages are mounted on the bed. They are adjustable along the bed by rack and pinion from a handwheel. No power feed is required as the rollers automatically feed themselves along the journal when set at a slight angle.

Two Burnishing Rollers on Each Carriage

Two burnishing rollers are mounted on each carriage for burnishing the front and rear of each journal simultaneously. The rollers are mounted in roller heads on roller bearings. Each roller head is bolted to a cross-slide, the bolt holes being elongated to allow the operator to adjust the angle of the roll to suit conditions.

The two cross-slides on each carriage are mounted on the same ways and are traversed by the same screw, one end of which is threaded right-hand and the other end left-hand. The pitch of this screw is such that when the rollers are forced against the journals

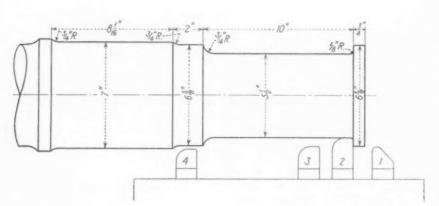


FIG. 8.—Arrangement of tools on right-hand carriage of center driven lathe to finish turn collar, journal, dust guard and wheel seat of 51/2 x 10 in. axle.

they will hold their position against the rolling pressure. The screw is not confined in the carriage endwise, but is free to float, thus the burnishing rollers are forced against the journal with equal pressure and no end thrust is taken by the screw or carriage. By setting the rollers at a slight angle, they automatically feed themselves along the bed and stop when they strike the shoulder of the axle.

The burnishing operation, as performed on this lathe, does more than give the journal a high finish. Through compression, the diameter is reduced about three-thousandths of an inch, and the surface hardness increased five to eight points, sclerescope. By burnishing a well-turned journal, the surface is brought to a condition equivalent to that produced by months of road service.

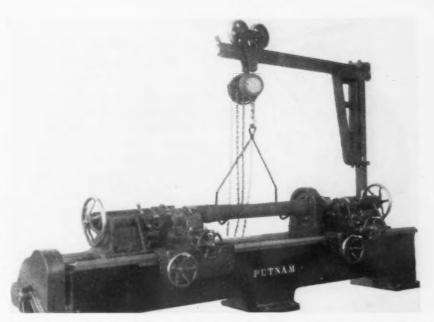


FIG. 9.—Axle burnishing lathe on which the thrust of the opposed burnishing rollers is absorbed in right and left-hand screws.

New Developments Accompany Economic Gains in British Steel Industry

MPROVED conditions in the British iron and steel industry last year proved a stimulus to plant development and research. Outstanding was the inauguration of Stewarts and Lloyds steel works at Corby, marking the first occasion on which steel has ever been made in the Northamptonshire district. Installation of two new blast furnaces and a sintering plant at Millom, Cumberland, is of interest because Cumberland ores are not used. Instead, ores from the Alguife and Florence mines are brought in, which contain a greater proportion of fines than the native ores but are more easily smelted. The plant's present capacity of 500 tons of sinter a day will eventually be increased to 750 tons. The two new blast furnaces, with a productive capacity of 250 to 270 tons daily, have retained the old type of vertical hoist for charging.

A strip mill installed by A. Lee & Sons, Sheffield, is claimed as the largest of its kind in the United Kingdom. Having a productive capacity of 100 tons a shift and adaptability to roll strip varying from 1 in. to 16 in., the mill is expected to satisfy the demands of the home market for this type of material, which heretofore has been imported.

A new electro-static gas cleaning plant was installed at Clyde Iron Works as a step toward improving fuel economy. Adopting a different attitude, Taylor Brothers decided to substitute town gas for firing various reheating furnaces, and to do away with the bulk of their gas producers. In the future, the latter will be used for firing open-hearth furnaces only.

A new unit installed at the Vickers Works of the English Steel Corpn. is a hollow forging press, designed to take ingots weighing up to 250 tons. The press, which is rated at 7000 tons, is said to be the largest of its kind in the world.

Industrial progress in Lincoln County last year made possible the construction of a new open-hearth furnace at the Redbourn Works of Richard Thomas & Co. At Appleby, an open-hearth of the tilting furnace type, rated at 300 tons, established a new record by producing 2750 tons of steel in one week.

Among outstanding research investigations last year, a joint committee undertook to increase the economic utilization of blast furnace slag. It was discovered that by "foaming" slag, or granulating it with a measured quantity of water, a product is obtained which is an excellent light-weight aggre-

gate for concrete. Practically all slags tested so far have given good results, although Hematite slags, having a high lime content are preferable, because of their high temperature. Methods are now being sought whereby prolonged aircooling of slag can be dispensed with in favor of a rapid test of the material's stability. Mortars containing "foamed" slag have been found to increase in strength with age, a peculiarity attributed to the cementing properties of the slag itself.

In another direction, a research group was formed to investigate the life of ingot molds and the effects their various physical properties have on steel quality. Application of some of the results of the study have already decreased the cost of molds in steel-making practice.

As a result of experiments conducted upon a waste-heat boiler at an open-hearth furnace in Yorkshire, a new type meter for measuring steam flow was developed. Despite fluctuating forces set up by the varying demands of operation, the meter in question integrated the flow positively, irrespective of the direction. Accordingly, the instrument's makers are prepared to recommend it for making routine steam-flow measurements.

The purely industrial investigations of the Iron and Steel Research Council continued throughout the year with gratifying results.



FOLLOW the illustrations closely, my friends, as the magic of the Professor draws from the crystal ball a solution to the many perplexities which face all who have themselves and dependents to support.



What Is Really Behind Machine

PERSONS who have pliably accepted the anti-modern-machine theories of political astrologers and their crystal-gazing brothers of the forum can find much within the four walls of almost any machine shop to upset such theories. Without the crystal it is difficult to "see" the shop mechanic reduced to a condition of nonentity, "as an absolute serf" because of "money control over modern production devices." Nor does the machine shop accept the "serf" classification.

This is an effort to uncover the facts as to what many men in our shops think about these things. These include executives, both managerial and financial, engineers and draftsmen, purchasing agents, foremen, skilled mechanics, men who actually operate production equipments, shipping clerks and salesmen.

The paradox of continued billions for relief and simultaneous labor shortages within certain industries, notably that of the machine shop, places added value upon opinions which spring from practical experience rather than from political theory.

wheeled buggy, and the magic lantern days.

American Mechanics Are Not

Theorists

form. It is largely a job of observation. "It's a better job than

Many theorists, spiritually solici-

tous for man's well being, have en-

tered the arena of "reorganized in-

dustrial ideals and principles." Generally they are well tutored in

a technocratic viewpoint of modern

machine purposes, but forgetful of

the home-made bread, the high-

yesterday's tinkering."

After three years of nibbling on samples of current substitutes for modern methods, and eating slowly enough to get the taste, the shop man finds himself much out of sympathy with many of the expedients through which it is proposed to "develop a more abundant life." Particularly is this so in the case of the mechanic, as these expedients seem to prescribe that, because he is a "worker," he must toss his individuality and genius into the paternalistic melting pot of social reform.

"To people who love mechanics

CHARGES of "industrial collusion," made by proponents of antimachine theories are a

product of thinking which does not include shop men nor seek their opinions. "Ignorance" is the word commonly used in the mechanics' reference to this type of propaganda; quite regardless of the motive behind it.

The machine shop knows few machines which operate without attention. It avoids machines which require too much attention. The day was, when a mechanic was hired because of his ability to tinker any kind of a machine into operating mood. That was yesterday. Today his operating job is to check and improve the consistency with which machines and tools per-

42-THE IRON AGE, March 12, 1936

FOLKS of the shop have their loves, perhaps proudly sentimental, but nevertheless scornful of cap and gown sophistries which prescribe that visions of happiness shall harmonize with what the Professor sees in the crystal.

ne



A LITTLE bee in the Professor's bonnet has whispered—"Oh, pshaw, Professor, why bother with blueprints? Blue is such a depressing color; that's probably where the depression came from."

Tool Improvement?

By L. M. WAITE

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and things pertaining to the actual operation and maintenance of machinery, there is no greater satisfaction than to see in operation machinery which is the last word in production and appearance." These people refuse to stop at the then fast mechanisms of even five years ago and still visualize more rapid production as the effective means for increased sales and wage rates.

The battle of mechanized prog-

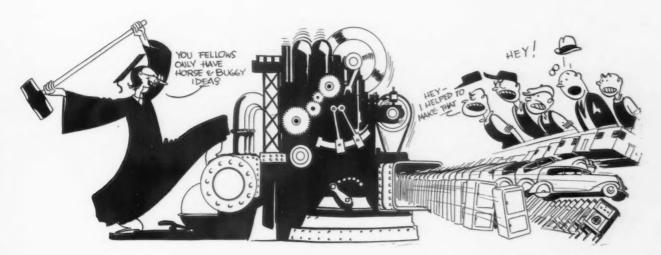
ress is not entirely painless, but it widens both employment and variety of things produced, thus bene-

HURRAH, my Brothers of the shop!

Join in! We have a key to the more abundant life.

fiting not only the mechanic, but his brothers—Tom, Dick and Harry. It stokes the fires and relegates the duties of the coal heaver to the past.

The mechanic regards the devices of modern mechanized effort as representing thoughts and ideas from thousands of moderately positioned men, who like himself, are normally engaged in obtaining more results with less effort. Having these views, he rejects the



stigma that "modern machine tools are the devices of capital."

From the viewpoint of employment, and quite contrary to rostrum reform philosophy, the shop recognizes that if machines are not progressively better, they become increasingly less effective in providing work within shops or places where used. Mechanics are naturally intrigued by assignments to new equipment and they will "pass up" employment on old equipment in one shop to "get on" new equipment in another.

Thousands of shop foremen, representing highly experienced shop personnel, are the working heads of American manufacturing enterprises. It will be a sorry day for "improved equipment" and for the men who work under foremen if ever foremen themselves and their duties are designated by groups acting under political concepts of "complete legislative control over industry."

"Less Production, More Wealth"

It seems that machine tools must bear a heavy brunt of condemnation from those who opine that we can live more abundantly by producing less. The modern machine tool is not a creation of any such guess work. Its basis is, rather, shop experience in producing those things for which the public indicates an increasing desire. Its purpose is to produce those things "at a price," for if not so produced. fewer, not more, people will be able to buy and there will be a lessening of general employment. Were it not for machine tools we would today have magic lanterns scattered here and there rather than a radio in every home. We would be proud of our horse and buggy, and Mrs. Housewife would not be a patron of the beauty shop.

Charges, either direct or implied, that individual engineers are "hired as a part of sinister scheming in a money controlled production program looking to the reduction of employment through huge-production machines" are received with short but expressive words of contempt in shops where such equipment is manufactured. It is pointed out that it would be very difficult to find a machine tool that is the product of an individual brain. It is held to be even more difficult to find a modern machine tool in which is not incorporated direct suggestions of many practical shop employees; and the indirect suggestions of many hundreds employed over wide areas. Implication that "money control," rather than interest in progress, has influenced these suggestions, and the art of working them out, recently brought out the typical reaction, "parlor pink bunk.'

How Improvements Are Brought About

Suggestions find their way into "improved" design and toolings through foremen and operator conversations, sales presentations, outside chats, cooperative get - to gethers, drafting rooms, testing floors and demonstrations in hundreds of shops in diversified industries. It is true that numbers of the suggestions may not relate to fundamental design, which is more or less the Hall Mark of the individual maker. Nevertheless they indicate unquestioned tendency among machine shop people to cooperatively participate in mechanized conservation of time and energy as main elements of safety and production.

Ability not only to design, but to take suggestions, visualize probable results from their applications, whip them, when basically sound, into workable mechanisms and to then incorporate with proved standardized mechanical movements, has featured a national machine tool development which from an employment viewpoint challenges every theory which would limit production devices. Any modern utility is an illustration.

Shop men of the types outlined

would rather be dependent upon their own abilities to get jobs in a world of modernized, even though "unplanned," production than to be compelled to prostrate themselves for further injections of bureaucratic theory.

To illustrate the shop romance of mechanical improvement, reference may be made to screw machines, although almost any other type of machine tool might be used as an example. Start from the early days with the pioneer hand-screw machines of such concerns as Pratt & Whitney, Garvin, and Brown & Sharpe. Through consecutive types, right up to the design of the latest multiple spindle automatic screw machine and its tooling, the one primary interest among foremen and machine operators has been to gain better and faster results with

One need only to run through a list of attachments, fixtures and devices suggested in hundreds of shops for application to successive types of screw machines to visualize a national shop participation in the perfection of machines and toolings as employed today.

Modern equipment is under more or less automatic improvement control for the reason that thousands of shop men and engineers, not money barons and schemers, have worked out applications of ideas for lessened fatigue.

"Dictated price fixing throws many a man out of a job or reduces his rate of pay, particularly when the dictators don't know what the inside of a shop looks like. Why not legislate that firms which fail to show a profit pass out of the picture? That would mean continuous buying to keep up with the procession. It is the continuity of profits which provides more and better employment. Why all the fuss to restrict them?"

There is a love and a philosophy of the machine shop and the machine and neither inspires class hatred.

Going Up!

The Standard of Living and Its Relation
To the American System of Enterprise

By MORGAN FARRELL

Director Chilton Bureau of Economic Research



THE burning question of the day is this: Are we going on to a higher standard of living, or

are we just to get ourselves out of this depression by waiting for the law of essential supply and demand to get to work?

The steel industry has been a conspicuous sufferer from the panic-times tendency to buy only under demand pressure. It is impossible to set anything like an even production pace and hence maintain employment, as long as buying continues to fluctuate spasmodically as each new measure of the New Deal goes into effect or as each old one into the discard.

However, there are present indications in the national sky that business is to be released more and more from governmental attempts to regulate or conduct it. In fact, we may as well recognize that the vast and hastily-conceived mechanism of Federal control, thrown together in the dark days of 1933, to start the wheels turning, has

failed to fulfill its function. The expected has happened. Emergency measures, adopted with the best of intentions, though clearly unconstitutional at the time, have been definitely declared to be so by the Supreme Court. Other measures may be expected to follow the same course.

Where Does That Leave Us?

Let us consider for a moment our standard of living, the highest for an entire people the world has yet seen. There are distinct causes which brought this about. Let us see if they are still operative. If they are, then our standard of living will continue to go up.

We all know what is meant by a high standard of living but, just to refresh our imaginations: It means a decent place to live, with home comforts and conveniences for all families including those well down in the income brackets. It means labor-saving devices in the home, movies, radio, magazines, Y.M.C.A.'s, parks, parkways, beaches and athletic fields for amusement; vast school and college systems, museums, botanical and zoological parks, countless art and medical foundations for men-

tal and physical welfare and advancement. And to supply all this, it means factories, power, air, rail and automotive transport, distributing systems, retail stores. No other nation on earth has all these adjuncts of a high standard of living in such profusion as we have—nor are they likely to have them.

In a recent address before the Detroit Industrial Safety Council, Mr. Charles R. Hook, president, The American Rolling Mill Company, had this to say about the living standards resulting from a century and a half of operation of the American System:

"We can produce practically everything our citizens need. Our people are the highest-paid workers in the world. We have the best highways in the world. More than fifty per cent of our families own their homes and these homes have more conveniences and are more comfortable than the royal palaces of kings of the old world of a comparatively few years ago. Twenty million of our citizens have savings bank accounts. Sixty million own life insurance policies. With 7 per cent of the world's population, the United States owns (CONCLUDED ON PAGE 126)

THE IRON AGE, March 12, 1936-45

Finishing of Manganese Steel



ONE reason why manganese steel is employed extensively in the construction of ex-

cavating machinery is that it is remarkably resistant to heavy have undergone remarkable improvement during the past decade, manganese steel can be finished economically by abrasive processes.

At the plant of the Marion

driven generally by electric motors or by diesel or other types of internal combustion engines. The company has been grinding manganese steel parts successfully for a number of years and in this article are illustrated and described a few of the most interesting abrasive operations.



The first grinding operation on any manganese steel casting consists of removing surface irregularities as shown in Fig. 1. The machine used is a heavy-duty swing frame grinder, the wheel being belt driven from the motor mounted at the back. The grinder is suspended by a chain hoist, and the wheel can readily be moved in any direction. The wheels used on these machines are manufactured alumina, 24 in. in diameter, 3-in.

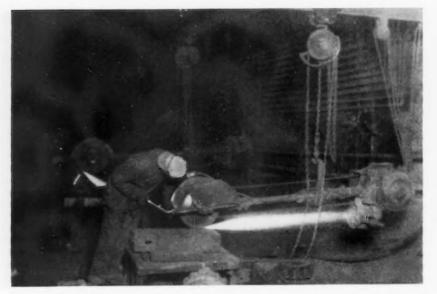


FIG. I—The first grinding operation is the removal of surface irregularities by means of swing frame grinders, such as shown above, or by portable grinders in the case of very large castings.

abrasive action. Further, when of correct composition and properly heat treated, it is very tough and durable. But manganese steel is too hard to be machined commercially with ordinary cutting tools, and thus when parts are made of this material on a production basis they must be finished almost entirely by grinding. To grind manganese steel successfully with ordinary abrasives is a long and costly procedure, but with modern manufactured abrasives, which

Steam Shovel Co., Marion, Ohio, manganese steel is used extensively in the manufacture of parts which must resist abrasive action and at the same time possess high tensile strength. This company has been manufacturing excavating machinery for more than 50 years and its products have been used in a number of notable projects, such as the Panama Canal and Boulder dam. The term "steam shovel" is a misnomer today because excavating machinery is



FIG. 3—Close-up of crawler sprocket Only the hub part is

Parts by Grinding

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By FRED B. JACOBS

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face, synthetic resin bond, operated at a surface speed of 9000 ft. per min. While this speed would be excessive for a vitrified bond wheel, it is perfectly safe with the type of wheel in question. These wheels are 12 grit in a hard grade. Wheels of this type are supplied by all leading grinding wheel makers and they are particularly economical for manganese steel grinding.

Very large castings, such as parts of dipper frames weighing several tons, cannot be ground under swing frame machines. As this is a case of taking the wheel to the work, the grinding is done with electrically driven portable grinders. Wheels used on these portable grinders are of various sizes, 8 x 1 in. being a popular size. They are 20 grit in a hard grade, generally in bakelite bond.

Flexible shaft grinders also are

used for a diversity of operations, one application being in removing of irregularities from gear teeth. The work is mounted on a bench to bring it to a convenient height so that the operator can feed the These machines are face grinders converted from 36-in. vertical boring mills. The wheels used are 14 in. in diameter, 2-in. face, 24 grit, medium hard grade, operated at a surface speed of 5000 ft. per min.



FIG. 2—Face grinding on a converted boring mill. The part on the machine in the background is a shipper pinion and that in the foreground is a 36-in. crawler sprocket.



showing the bushing in the square hole finished by grinding.

part is

wheel up and down the teeth by hand. The wheel used is manufactured alumina, 10 in. in diameter, 1-in. face with the face shaped slightly tapered to fit the tooth contour. These wheels generally are 16 grit vitrified bond in a hard grade.

Face Grinding on Boring Mills

Two interesting face grinding operations are shown in Fig. 2.

The table speed is approximately 70 r.p.m. The part in place on the machine in the background is a shipper shaft pinion approximately 18 in. in diameter, the object of grinding being to level the sides. The part on the machine in the foreground is a crawler sprocket, 36 in. in diameter, 12-in. face. From the accompanying close-up view of this part, Fig. 3, may be seen that the square hole is fitted with a bushing. This bushing is a grade of steel that can be machined

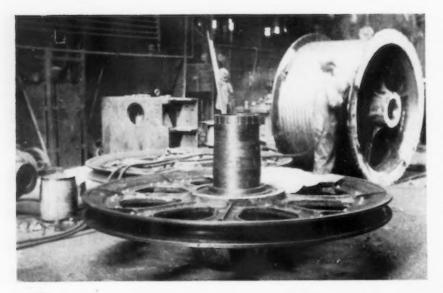


FIG. 4—Two-piece sheave, 90 in. in diameter, ground on 10-ft, boring mill.

of parts can be located in a vertical position for various internal grinding operations as will be explained later, face grinding is done more economically by locating the work on a horizontal revolving table. If manganese steel parts could be located on magnetic chucks the problem of locating the work would be greatly simplified. However, this material cannot be held by magnetic attraction. Thus special holding fixtures and clamping devices are necessary in the majority of cases.

Grinding a 90-In. Sheave

Another excellent example of grinding done on a boring mill is

by ordinary cutting tools. Thus when machining must be done in places where it is not convenient to employ grinding, soft steel inserts are used. As Fig. 3 shows, only the hub of the part is finished by grinding. Referring again to Fig. 2, machines of this type are ideal for surfacing operations on comparatively heavy parts as the problem of locating the work for grinding is greatly simplified. All that is necessary is to locate in place by means of a chain hoist and then fasten it down by straps or other holding means provided for the purpose.

While it is true that a number

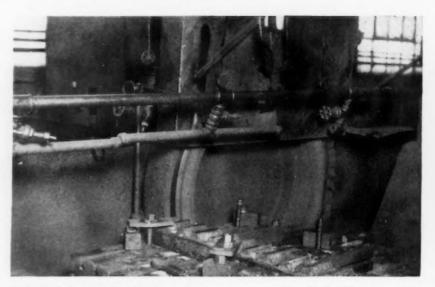


FIG. 5—Ends of rack sections are wet ground on a machine fitted with reciprocating platen and a 44-in, sectional wheel. The same machine is used to surface the bottom of the racks

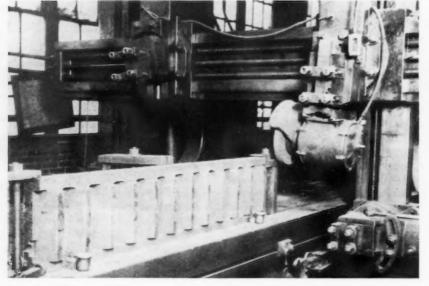


FIG. 6—When it is necessary to grind up to shoulders on the racks, planers fitted with a grinding wheel are employed.

shown in Fig. 4. This part is a sheave 90 in. in diameter, 6-in. face, with a cable groove 4%-in. deep. The rim of this part is manganese steel firmly bolted to machine steel spokes. Solid construction of a sheave of this kind is not practicable due to the fact that manganese steel shrinks 5/16 in. to the foot in cooling. If the sheave were a solid manganese steel casting the spokes naturally would cool and shrink first and an excessive amount of breakage would result. The two-piece construction overcomes this difficulty.

The part in question is ground on a 10-ft. vertical boring mill with grinding heads mounted on the tool slides. The outer diameter and the cable groove are ground at one setting. Also the sides of the rim are ground flat for a distance of 11/4 in. from the outer rim diameter. In this operation the work is strapped to the boring mill table and rotated at a speed of approximately 20 ft. per min. The wheels used are manufactured alumina, 24 in. in diameter, 21/2-in. face, 14 grit, synthetic resin bond, in a medium hard grade. The wheel for grinding the cable groove must of course have a formed face, while an ordinary straight face wheel can be used for finishing the outer diameter. These two wheels are operated on a vertical spindle, while the wheel for facing the sides of the work is mounted on a

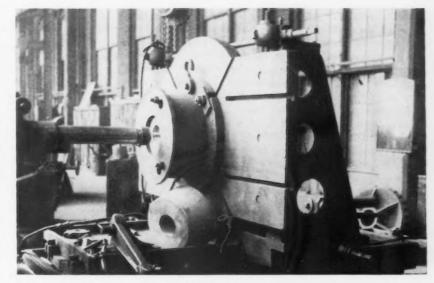
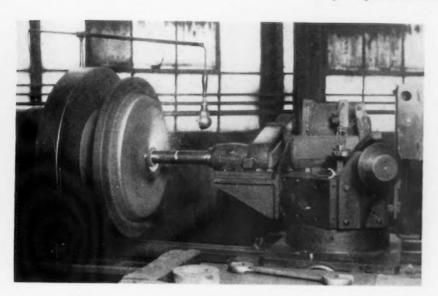


FIG. 8—Planetary-type grinder fitted with angle iron locating device and special fixture for grinding the bore of hardened steel cone rollers.



min. Table travel is at the rate of approximately 20 ft. per min. This grinding operation is done wet. As the illustration shows, the work is strapped directly to the machine platen. This machine also is used for surfacing the bottoms of these racks which are 5-ft. long, 8-in. wide, 4-in. thick, while the pitch of the teeth is 4 in.—that is, 4 in. tooth to tooth.

The machine shown in Fig. 5 is of course limited to straight surfacing work, that is, the work must be of a nature that the entire surface can be fed past the wheel. When it is necessary to grind up to shoulders on the racks in ques-

horizontal spindle. These wheels are run at a surface speed of 9000 ft. per min.

Finishing of Rack Sections

Comparatively long racks are made in sections. Thus the ends must be ground to generate the correct pitch dimension between the teeth at each end of abutting sections. This operation is done as shown in Fig. 5. The machine is a surface grinder fitted with a reciprocating platen and a sectional cylinder wheel mounted on a horizontal spindle. The wheel is in 15 sections. It is 44 in. in diameter, 20 grit, manufactured alumina vitrified bond, and is operated at a surface speed of 6000 ft. per

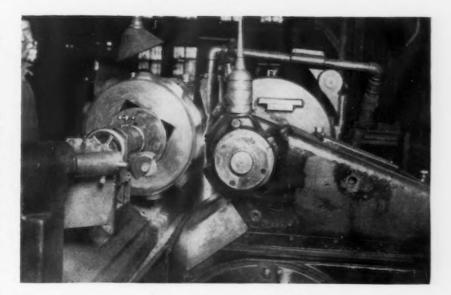


FIG. 9—Grinding the outside diameter of 24-in. manganese steel shipper shaft pinion.

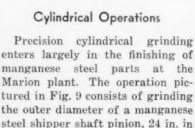
tion the operation is performed on a metal planer fitted with a grinding wheel as shown in Fig. 6. The work is clamped directly to the planer table in which position the wheel can be fed up to the shoulder. The grinding wheel is mounted directly on an electric motor which is held in the tool post. The wheel used is manufactured alumina 12 in. in diameter, 2-in. face, 24 grit vitrified bond, and is operated at a surface speed of approximately 5000 ft. per min.

Comparing the machines pic-

the pot fixture is to locate the gear from the outside diameter of the teeth. Set in this manner the bore will be square with the pitch line, which of course is necessary. Otherwise the gear would not run true when finished.

The machine used for this operation is an internal grinder made from a heavy-duty turret lathe. As shown in Fig. 7, the internal grinding spindle is fastened to an angle iron bracket which in turn is fastened to one of the turret faces. The driving motor is located at

The angle iron can be moved sidewise or vertically, these movements being controlled by screws fittted with micrometer dials. Thus close settings can be made readily. The roll in process of grinding locates in a special fixture fastened to the angle iron, as the illustration shows. The work is held in place by a cover, the cover being locked in place by three nuts working over studs. Slots in the cover end in holes of larger diameter than the locking nuts so that the cover is removed readily for loading and unloading the fixture. The wheel used on this machine is manufactured alumina, slightly under 3 in. in diameter, 1-in. face, 36 grit medium soft grade operated at a surface speed of 5000 ft. per min.



Marion plant. The operation pictured in Fig. 9 consists of grinding the outer diameter of a manganese steel shipper shaft pinion, 24 in. in diameter, 14-in. face. The gear has a square hole and is fitted on a special arbor which in turn is located between the grinding machine centers in the usual way. This machine is a plain cylindrical grinder capable of accommodating work 20 in. in diameter and 14 ft. long. However, a gap is provided in the bed for accommodating large work such as the gears in question. The wheel used is manufactured alumina 20 in. in diameter, 3-in. face, 40 grit medium grade, operated at a normal peripheral speed of 6000 ft. per min. The work speed is about 15 r.p.m.. This is a very rigid machine and can be forced to maximum production.

In Fig. 10, two of the pinions ground as above described are shown in the foreground. Back of these is a variety of steel shafting also finished on this machine. These shafts are of various diameters up to 8 in. while the lengths run from 3 to 10 ft. Before installation of the machine shown in Fig. 9 it was necessary to finish these shafts by the somewhat slower process of turning and filing. Where the grinding machine is used for finishing, the work is rough turned, leaving only about 1/32 in. for finishing by grinding. Grinding not only brings about the necessary accuracy to assure ready assembly, but it reduces production costs.



FIG. 10—Steel shafting, as well as shipper pinions, are ground on the machine shown in Fig. 9.

tured in Figs. 5 and 6, it is obvious that the machine shown in Fig. 5 will remove more stock per minute due to the fact that its wheel has a comparatively large cutting surface. However, the utility of the type of machine shown in Fig. 6 is not to be overlooked as such a machine is capable of performing a number of grinding operations not possible with a cylinder type wheel.

Internal Grinding

Considerable internal grinding is necessary in finishing the bores of bevel gears, rollers, etc. The operation shown in Fig. 7 consists in grinding the 6 x 6-in. bore in a 26-in. diameter bevel gear. The gear is located in a pot-type fixture which is screwed to the head-stock spindle nose. The object of

the back, the drive being through an endless belt. The grinding wheel is manufactured alumina, 4 in. in diameter, 1-in. face, 24 grit in a medium hard grade. It is operated at a normal surface travel of 6000 to 8000 ft. per min. With a work speed of 120 r.p.m. this wheel gives good results. At the extreme right of Fig. 7 may be seen a cone-shaped piece in place on the turret; this is used for locating the work central.

Another interesting internal grinding operation is shown in Fig. 8. This work consists of grinding a bore 3 in. in diameter and 5-in. deep in a hardened steel cone roller 9% in. in diameter at the large end, 8 in. in diameter at the small end. The machine used is a planetary type grinder fitted with a special angle iron type locating device.



E. P. BULLARD, President, Bullard Co. Drawn by John Frew for The Iron Age.



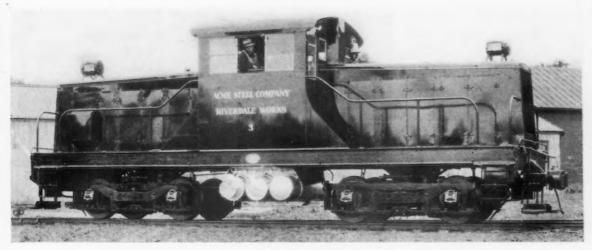


FIG. I—Butane tanks, with air tank in between, are mounted centrally under the locomotive frame. Filling cap and control valves are readily accessible.

Acme Has First Butane-Electric Switching Locomotive

By W. Z. FRIEND and L. H. WRIGHT

Philgas Department, Phillips Petroleum Co.



liquefied petroleum

gases, propane and bu-

tane, over other fuels in the operation of locomotives and rail trains are: first, the fact that considerably higher compression ratios can be used with them than with gasoline; and second, the completely gaseous form in which the fuel is fed to the carburetor or gasair mixer, as a result, there is thorough mixing of the fuel and air and uniform distribution of the mixture to the engine cylinders. The octane number of propane is above 100 and that of butane 93, both greatly in excess of premium grades of anti-knock gasoline now available at 76 octane number. This means that compression ratios as

A STEP of potential significance in transportation progress was made when a 65-ton Plymouth butane-electric locomotive was placed in service at Acme Steel Co.'s Riverdale, Illinois, plant the early part of June, 1935. This is not only the largest switching locomotive to be operated with liquefied petroleum gas, but the first locomotive of any kind to be originally designed and constructed for utilizing these increasingly important fuels.

high as 10 to 1 with propane and 7 to 1 with butane can often be successfully used. If full advantage is taken of the higher cylinder pressures obtainable, considerable increases in power output and thermal efficiency are obtained, together with other significant advantages such as low oil consumption, low maintenance costs, and almost complete elimination of carbon and carbon monoxide formation.

Best operating results with propane and butane have been shown in vehicles operating most of the time on open throttle where complete advantage can be taken of the improved fuel mixing and distribution characteristics. Since this is the type of service generally re-

quired of switching or tunnel locomotives, full advantages of the liquefied petroleum gas fuels can be realized in their operation.

One of the two 6 x 7-in. eightcylinder "Blue Streak" engines used to power the new locomotive is illustrated in Fig. 1. These are standard Climax R8-1 engines equipped with special heads providing a compression ratio of 6 to 1, and are designed to produce 250 hp. at 120 r.p.m. Each of the engines is directly connected through heavy thermoid couplings to an electromotive-type d.c. General Electric generator with a continuous rating of 290 amps. at a nominal voltage of 500, supplying current to the truck motors. These motors are centrally hung, two on each truck, and are heavy-duty, spur-geared traction type, forced ventilation developing 116 hp. per hour at a nominal voltage of 250. Each is connected to its axle through single - reduction gearing of 81 to 16 ratio.

The new locomotive is shown in Fig. 2. It is 40 ft. long overall inside of the coupler knuckles, 14 ft. high over the cab and 10 ft. wide. The main frame construction is of heavy I-beams substantially cross-braced, welded into position and abutting upon a heavy 4-in. slab steel bumper at each end. Across the entire top of this main

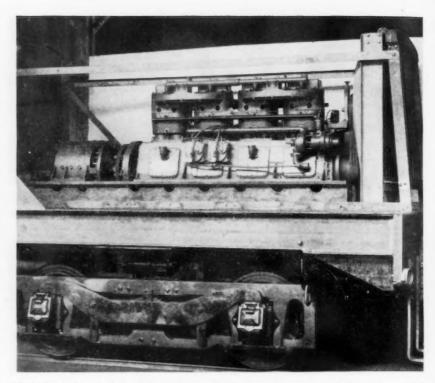


FIG. 2—Eight-cylinder, 250-hp. engine operating on butane gas and direct connected to generator. The vaporizer-regulator units, one for each bank of four cylinders, are seen on the side of the crankcase.

frame is welded a ½-in. steel plate having a slip-proof surface and serving to stiffen the entire structure. Each power unit is mounted on a separate welded base, removable from the main frame and capable of accurate alinement.

Operation of the butane - fueled

Plymouth locomotive to date has shown that 8 hours is now required to perform switching duties previously requiring 14 hours with a steam locomotive. This is in the heaviest type of switching duty, almost continuously on curves and grades and with many reversals.

Executive Salaries Are Analyzed

OMPENSATION paid to executives represented only 2.3 per cent of the receipts of corporations in 1933, according to an analysis made by the National Industrial Conference Board. At the present time this slight percentage is even lower, since it declines with a rising volume of business.

The ratio of compensation to receipts was found to be highest, 5.1 per cent, in the case of service corporations and lowest, 0.8 per cent, in the case of transportation and other public utilities.

Manufacturing corporations paid executive salaries representing, on the average, 2.0 per cent of their receipts. The percentage varied widely, however, in different industries, ranging from 0.6 per cent in the case of tobacco to 4.9 per cent in printing and publishing.

The significant reason for the varying percentages among the industries appears to be, not the nature of the industry, but its organization in large or small units. The ratio is highest in the case of smaller corporations. Corporations having less than \$50,000 of assets paid 7.1 per cent of their receipts in salaries, while corporations with assets of \$50 million or more paid only 0.4 per cent.

The conference board's analysis also indicates that at no time during the depression have executive salaries tended to absorb an unreasonably large proportion of receipts. Between 1929 and 1932, the percentage tended to rise as a result of the decline in the volume of business. At the low point in 1932,

manufacturing corporations paid 2.3 per cent of receipts to executives as compared with 1.6 per cent in 1929; mining and quarrying corporations, 2.3 per cent as compared with 1.4 per cent; transportation and other public utility corporations, 0.8 per cent as compared with 0.6 per cent; trading corporations, 2.7 per cent as compared with 2.2 per cent; service corporations, 5.0 per cent as compared with 5.2 per cent, and finance corporations, 4.6 per cent as compared with 3.9 per cent. In practically all of these fields, the proportion computed for 1933 was slightly less than in 1932.

The average salary of principal officers in manufacturing was \$6,689 in 1929, the latest year for which data are available. The average in wholesale trade was \$5,860; in mining, \$4,915, and for steam railroads, \$4,599.

A.S.T.M. Reviews Constructional Metals

WITH approximately 1000 members registered, last week's American Society for Testing Materials' regional meeting at Pittsburgh established itself as one of the most successful affairs in the history of the society. Many of the visiting members were directly concerned with committee and sub-committee meetings to establish standards or present progress reports on experiments concerned with future standards. However, the major drawing card was a five-paper symposium on high-strength constructional metals.

The first paper of this symposium concerned itself with alloys of aluminum and magnesium. It was presented by J. J. Bowman on behalf of himself and the co-author, E. H. Dix, Jr., both of the Aluminum Co. of America.

The Dix-Bowman paper pointed out that the strength of cast, commercially-pure aluminum and magnesium is approximately 13,000 lb. per sq. in., and that of the strongest commercial wrought alloys not over 70,000 lb. per sq. in. and 55,000 lb. per sq. in., respectively. It is evident, then, that these alloys are not, strictly speaking, high strength metals; yet their high strengthweight ratios make them desirable for all constructional uses where light weight is at a premium, so they properly may be considered "high strength constructional metals."

The paper gave a complete résumé of the mechanical properties and metallurgical characteristics of the light alloys. However, these data are not included herein for they are readily available to A.S.T.M. members in the report of Committee B-7 on "Service Characteristics of Light Metals and Their Alloys," published in 1934. In addition, the application of these alloys in transportation was discussed recently at the New York A.I.M.E. meeting by Dr. Zay Jeffries.

Dix and Bowman pointed out that there are now so many different aluminum and magnesium alloys of only slightly varying mechanical properties that the engineer may be confused and find it somewhat difficult to make a selection of the proper alloy for his particular requirement. They then attempted to clarify this situation by devoting most of their paper to pointing out the specific characteristics which distinguish the various important alloys.

For instance, it was pointed out that the principal structural wrought alloys in which copper is the only hardening constituent are 25S and 27S. These alloys contain about 4.5 per cent Cu, 9.8 Si and 0.8 Mn. The alloy 25S is distinguished by its comparative ease of hot forging, and, although it has been used in a variety of forms, is now employed principally for forgings. The alloy 27S-T (the T means fully heat-treated temper) is characterized by an exceptionally high yield strength and good resistance to corrosion and is used primarily for rolled structural members requiring these properties. As would be expected from the high ratio of yield to tensile strength, and the relatively low elongation of this alloy in the T temper, it is not readily formed cold. However, because of a fortunate combination of elements producing unusual aging characteristics, this alloy can be heated for as long as 1/2 hr. at a temperature as high as 400 deg. Fahr. for hot forming without influencing either the mechanical properties or resistance to corrosion. The alloy has found its principal commercial applications in bridge structures, large dragline buckets and, to some extent, in truck bodies.

Also described was alloy 53S (0.7 Si. 1.25 Mg, 0.25 Cr) which was developed primarily for applications requiring exceptionally high resistance to corrosion. This characteristic has been obtained by using high purity aluminum and closely controlling the composition. The alloy is finding extensive use for all applications where high resistance to corrosion combined with moderate strength and good workability are required, such as in marine use. It is also widely used where maintenance of a pleasing appearance is desired, as in the case of window sections and decorative trim, and for these purposes is often "alumilited," that is, coated with an electrolytically-produced, hard, abrasion and corrosion-resistant oxide coating.

While the emphasis in the Dix-Bowman paper, because of the subject assigned, was placed upon high strength, the authors devoted some time to emphasizing the fact that in designs embodying aluminum alloys the limiting requirement is very often stiffness. This is because of the relatively low modulus of elasticity of aluminum alloys. Consequently, it is an economic mistake to employ alloys having a strength higher than that required when the size of the section is dictated by stiffness considerations; that is, for many applications, the desired weight saving can be obtained without resorting to the more expensive high-strength, heattreatable aluminum alloys.

Magnesium Alloys

After elaborating on the physical characteristics and fabricating processes for many aluminum alloys other than those just described, the authors devoted considerable attention to various magnesium alloys. They pointed out that up to the present time, one of the principal fields of use for magnesium alloys in this country has been in aircraft, where the light weight of the material is especially advantageous. However, there is a growing demand for these alloys in other commercial fields where light weight in portable and moving equipment is important. Magnesium alloy castings compare favorably in strength with most aluminum castings and can frequently replace the latter with a saving in weight. In parts where strength is not a controlling factor, magnesium alloys can be used to replace aluminum with a weight saving of about 33 per cent. In addition to their light weight, the magnesium alloys have the advantage of what is probably the best machinability of any commercial metal. This excellent machinability in many cases helps materially to offset the original higher cost. Although their (CONTINUED ON PAGE 81)

THE IRON AGE, March 12, 1936-55

By FRANK J. OLIVER

Detroit Editor, The Iron Age



THIS WEEK O'N THE

Automobile Production Swings Into Stride as Spring Sales Climb

DETROIT, March 10

PRING seems to be definitely here. So far as automotive production and sales are concerned. The optimism expressed a week ago has been justified and schedules are being advanced once more. Chevrolet is planning to turn out about 125,000 units in March as against 75,000 in February. Ford is producing about 5000 cars a day and Plymouth is making 2000 motors daily. About 1600 Plymouths are coming off the line each day in Detroit, the additional units being assembled at Los Angeles and Evansville, Ind.

The battle for first place between Ford and Chevrolet is on again, hotter than ever. Ford United States registrations for 1935 at 826,519 units exceeded Chevrolet's registrations of 656,698 by a considerable margin. Taking the registrations on 1936 models to date, however, Chevrolet has shown a 15 per cent gain over Ford. In fact, in the first 20 days in February, approximately 25 per cent more Chevrolets were registered in the United States than Fords. In the local battleground of Wayne County, however, Ford registrations have been almost double those of Chevrolet.

Figures for some of the independents have been coming in. Studebaker reports total February sales of 6170 passenger cars and trucks, a gain of 45 per cent over February, 1935. Sales of Hudsons and Terraplanes totaled 5100 units. Buick produced 89,390 cars in February and by February 20, had sold 55,479 at retail. Packard produced over 5000 of its 120's in February and expects to build 7500 in March, thus topping all previous months. Lincoln has expanded Zephyr production to 125 a day and is now installing equipment to increase the output of the motor

These figures reveal that business in the medium-priced cars is picking up. Another indication is that in recent weeks a number of companies have announced special models, such as convertible sedans, which ordinarily go only to the luxury trade.

February Ahead of Last Year

Despite the low dip in production and sales in February, it now appears that registrations for the month will be ahead of similar registrations for 1935, a much warmer month. This situation would indicate that the fall model introductions had not robbed the winter months of their normal sales, and there is every likelihood now that March figures will be the best in many years. Commitments on steel confirm this inference.

In the meantime, activity on the 1937 models is becoming increasingly important. Tool and die designers have been much in demand in recent weeks, and it is understood that because of lack of skilled designers, some companies like Fisher Body are several weeks behind in their die design schedules. Fisher's die program has already started in the shop and it is expected that by the middle of March most of the job shops in Detroit will be actively engaged on 1937 model tools.

Aside from the fact that it is quite apparent that there is a definite trend toward eliminating the sameness in automobile body design for next year, there are also all kinds of supporting rumors to indicate a number of important mechanical changes. The adoption of the hypoid gear drive in the rear



ASSEMBLY LINE

axle by two major factors in the industry is such a move. Engine and transmission changes are also in the wind, and it is rumored that one of the larger builders is contemplating a reequipment program to take care of a car that will be completely redesigned from bumper to bumper.

Labor Situation Quiet

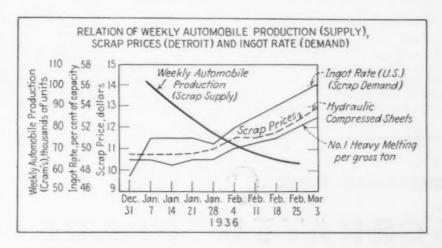
Detroit continues to keep a watchful eye on the Akron situation, since a curtailment of Goodyear's production may ultimately be a serious factor in automotive production. Here in Detroit the Motor Products strike, which has been dragging on for almost four months, has been popping up in the newspapers almost daily for the past week. Strikers' committees have been parking on the City Council's doorstep to see if they can enlist the aid and sympathy of the City Fathers in furthering their interests. First, they protested against the "dawn patrol," a private police service employed Motor Products, which they claimed had been responsible for hurling gas bombs into the strikers' homes. The company denied that the patrol engaged in any such activities, and the Police Department also denied that it had unduly molested the strikers. The Council so far has refused to intercede in behalf of the strikers, and the County Relief Administration has turned down the request not to have the strikers on "relief" certified for WPA jobs.

The way things are now, this particular situation seems to be all one-sided. The company has been going ahead with about 2100 men at work and seems to be paying little attention to efforts of those on the outside to arbitrate for a return to

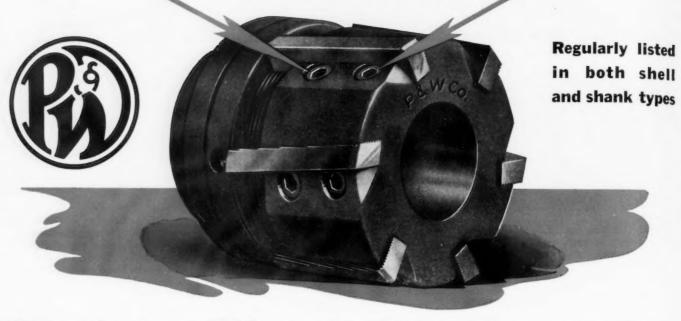
their jobs. The morale of the strikers is now so low that several of the leaders have offered to withdraw from the picture entirely if the rest are returned to their jobs—an unlikely possibility.

Outside of this particular situation, organized labor in Detroit is being subjected to further disintegration. One of the locals of the Mechanics Educational Society recently seceded to form a new union called the Metal Craftsmen's Union, limited to workers engaged in the manufacture or maintenance of tools, dies and machinery. apparent reason for the secession was the fact that the M.E.S.A., in order to build up its membership, had taken in production workers. The new group felt that better progress could be made in organization by forming a separate union for tool and die men only. This particular move should be a warning to John L. Lewis in his plans to further vertical unions in the automotive industry. There is a class consciousness among the skilled workers that simply cannot be ignored. This whole question will come up at a meeting of the United Automobile Workers Union, opening in South Bend on April 27 and Detroit locals of federal unions have been asked to hold meetings to instruct the delegates how to vote on the important question of Green vs. Lewis policies.

The Automobile Manufacturers' Association has stated that production of automobiles gave work in 1935 to a higher average number of persons than in any preceding year except 1929. Despite the fact that 1935 output was 1,250,000 units below the 1929 mark, average employment was 435,000 workers, as compared with 439,000 in the boom year. It will be interesting to make the comparison, when figures are available, on the average number of hours worked per year by the workers. Fluctuations in numbers on the payroll have been held to a minimum, in that only two months in 1935 showed fewer than 400 .-000 employees on the payroll. In the recent lull in activity, lay-offs up to about 10 per cent were com-



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SERRATED BLADE REAMERS

mon, and as many workers as possible were kept on a part-time basis of two to three days a week.

Highway Safety Stressed

Motor vehicle administrators met in Washington last week to declare open warfare on the "lunatic fringe" of motorists and pedestrians, whom they called the primary cause of traffic accidents. feel that the best way to cut down fatalities is to get the reckless and inept driver off the streets. If their determination means anything, more people will lose their licenses this year than ever before. Alfred Reeves, vice-president of the Automobile Manufacturers' Association, has pledged the full support of the automobile industry in the enforcement of this program. As if to check these conclusions, a recent survey made in a dozen States indicates that mechanical difficulties are the smallest of any single cause of highway accidents. Compulsory mechanical inspection has not resulted in a consistent improvement in the mechanical condition of the vehicles from year to year and has not resulted in a reduction of accidents attributed to this cause.

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Speaking before the Chamber of Commerce at Battle Creek, Clarence Francis, president of General Foods, Inc., proposed the construction of high-speed, safety-zoned, illuminated and possibly elevated super-highways to form a network in congested areas from Coast to Coast. Such a program would not only reduce the toll of accidents, but would also give useful employment to WPA workers and the construction industry in general.

New Glare-Proof Glass Developed

Blinding headlights are frequently given as a cause for highway accidents. Hence the industry is taking considerable interest in an inexpensive form of polarized glass developed by the Land-Wheelright Laboratories. The glass, which can be obtained in sheets up to 14 in. wide and several feet long, is composed of two sheets of glass between which is a thin sheet of cellulose acetate, just like shatterproof glass. In this thin film, however, are suspended minute synthetic crystals somewhat similar to Iceland spar, each with its polarizing axis in the same plane. Only light vibrations in this one plane are transmitted through the glass.

Hence if all car headlight windshields were equipped with such glass polarized at 45 deg., approaching cars would have their headlights polarized at 90 deg. to the windshield of the first car and the driver would see only a dim headlight approaching him, whereas the road would be perfectly illuminated.

An Australian firm is encasing zinc die castings in Tenite, a product of the Tennessee Eastman Corpn. Chief application is on door and window handles for motor cars. Some strikingly beautiful effects have been obtained.

Basically, nitro-cellulose lacquers come from the same source, that is, the cellulose found in vegetable fibers, like cotton, for example. Possibly because of its close association with du Pont, General Motors has stuck to the pyroxiline finishes, although, first Ford and then Chrysler changed to the synthetic enamels, derived from soy beans. Sales departments find good arguments for both. One of the problems has been the recovery of the excess lacquers in the spray booths. Lacquers can be successfully reclaimed by floating off water, but the synthetic enamels have defied efforts for recovery in either water or oil or a combination of both.

Heavy Commercial Steel Demand in Britain Augmented by Defense Program

ONDON, March 9 (By Cable) .-Output of basic pig iron is rapidly increasing and production of foundry and hematite may be extended soon. Meanwhile consumers are seriously embarrassed by foundry iron shortage, as makers are curtailing deliveries and are unable to accept further Hematite makers have orders. been drawing heavily upon stocks. The coke scarcity has been relieved partially by large purchases in Holland. Steel works are very active and most sellers are reluctant to consider business beyond June. There is heavy specifying of structural and ship building steel. There has been an improved flow in orders for new ships. Government proposals for expansion of national

defenses have increased confidence in further expansion of steel trade, but it is feared that national requirements may interrupt fulfillment of commercial orders. Heavy steel prices may advance this month.

Home orders for tin plates have increased, mainly owing to the probability of an early price advance. Export buying is improved, notably from South America, South Africa and Australasia.

Continental iron and steel new business is quieter but works hold good order books. United Kingdom demand is still expanding and the United Kingdom import quota of semi-finished steel may be increased again. Business in bars and thin sheets is better.

British Prices, f.o.b. United Kingdom Ports

Per Gross Ton

Ferromanganese, export £9

Billets, open-hearth £5 10s. to £5 17s. 6d.

Tin plate, per base box.....

18s. 9d. to 19s, 31/4d.

Steel bars, openhearth £7 171/2s.

Beams, open-hearth £7 121/2s.

Channels, openhearth £7 171/2s.

Angles, open-hearth £7 121/2s.

Black sheets, No.

24 gage..... £9 15s.

Galvanized sheets, No. 24 gage...£11 15s.

Official Continental Prices, f.o.b. **Continental Ports**

Per Metric Ton, Gold £

Current dollar equivalent is ascertained by multiplying gold pound prices by 124.14 to obtain franc equivalent and then con-verting at present rate of dollar-franc exchange.

Billets, Thomas. £2 7s. Wire rods, No. 5 B.W.G. £4 10s.

Billets, Thomas. £2 7s.

Wire rods, No. 5
B.W.G. ... £4 10s.

Steel bars, merchant ... £3 5s.

Sheet bars. ... £2 8s.

Plate, ½ in. and up ... £4 6s. 6d.

Plate, 3/16 in.
and 5 mm ... £4 8s. 8d.

Sheets, ½ in. ... £4 9s. 8d.

Beans, Thomas £3 2s. 6d.

Beans, Thomas £3 2s. 6d.

Hoops and strip base ... £4 2s. 6d.

Wire, plain, No. 8 ... £5 7s. 6d.

Wire, barbed, 4 pt. No. 10

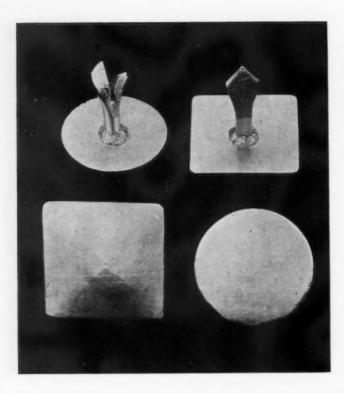
B.W.G. ... £8 15s.

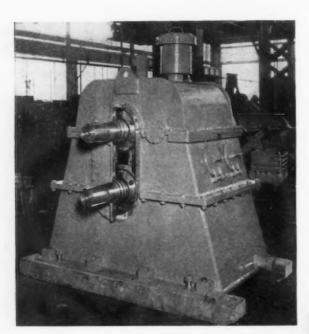


ROAD markers of stainless steel are being installed at some 10,000 pedestrian crossings in London, a recent ordinance having made the use of stainless steel traffic markers for new crossings mandatory in certain sections of the city. Whether forged, cast, or pressed, stainless steel is held to offer definite advantages over many other marking materials. The studs remain clean and bright under all conditions of weather and traffic and are easily visible. In addition, they are extremely hard and tough and will not break, distort or lose their finish under the severest traffic conditions.



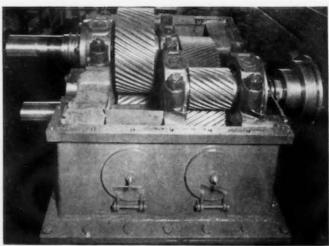
THIS photograph is not intended as an example of a modern industrial camera study, although it could very well serve that purpose. Instead it illustrates the efficiency modern industrial methods have attained. After more than eight years of continuous subjection to a severe sulphurous atmospheric condition this Enduro stainless steel bolt, made by subsidiaries of the Republic Steel Corpn., was found to be still in good condition. Installed in June, 1927, to fasten two bronze fittings in a station of the Ohio Power Co., the bolt was removed in September, 1935.





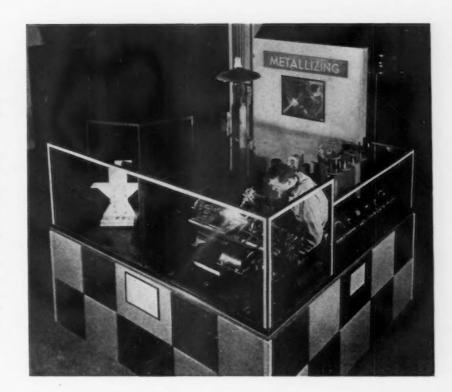
ABOVE AND AT RIGHT

THE accompanying photographs illustrate the 150 hp. combination gear drive and pinion stand, which has been manufactured for the new 42-in. 4-high temper pass mill at the Gary, Ind., plant of the American Sheet & Tin Plate Co. The design presents an attractive unit and for the purpose is said to represent a noticeable improvement over the large cast iron and cast steel cases that were used previously.



AT RIGHT

DEVICE has just been intro-A duced whereby your kitchen table may be coated with metal as easily as it may be painted; old crankshafts may be built up to look and perform like new, and women may have evening dresses with the shimmering, scintillating appearance of pure sheaths of silver. A spray gun which uses metal instead of paint or lacquer by means of the atomization of wire in an oxygen acetylene flame of 6500 deg. is the secret of all these interesting claims. It will metallize any clean roughened surface, whether metal, wood, cloth or concrete, and is being exhibited at the Museum of Science and Industry. Chicago, by the Metallizing Engineering Corpn., Los Angeles.



BELOW

VALUABLE collection of 650,000 bird skins in the American Museum of Natural History is protected by 2100 steel cases which if placed side by side would extend for two miles. They contain 52,000 drawers and if one took the trouble to place one upon another they would tower into the sky, a height equal to three times that of the Empire State building. The cases are of arc-welded construction and were made by the Art Metal Construction Co., Jamestown, N. Y.



ABOVE

DIES of this type, with the cutting edge protected by a welded-on layer of non-ferrous hard-facing alloy, are employed to form can tops at the plant of a large manufacturer of cans. The hard-faced dies are said to last four times longer than the dies formerly employed. (Photograph is by courtesy of the Haynes Stellite Co.)



THE IRON AGE, March 12, 1936-61



BY L. W. MOFFETT Resident Washington Editor, The Iron Age

ASHINGTON, March 10. -The third anniversary of the New Deal occurred last Wednesday. . . . New Dealers made the country thoroughly aware of the fact. . . . Floods of speeches and statements extolling the New Deal came from Cabinet officers and lesser lights of the Administration. . . . Panegyrics that took on the aspect of blatancy regaled audiences as they were told of the marvels achieved by the New Deals Encomiums were undiluted. . While even some of the New Deal's supporters, including Senator Tydings of Maryland, have bitterly criticised it for some of its policies and are urging their abandonment, not a single error was conceded in the tidal wave of praise heaped upon it. . . . The political axiom to concede nothing and to take everything was scrupulously followed....

This being an election year, of which both New Deal and anti-New Deal spokesmen appear to be more or less cognizant, the orthodox role adopted was perhaps the

THIS WEEK IN WASHINGTON

Third birthday of New Deal is occasion for national rejoicing on part of its exponents

Proposed tax revisions arouse storm of protest in Washington.

Railroads plead for permanent continuance of emergency surcharges.

Richberg comes to defense of basing point system in steel industry on eve of Congressional hearing on Wheeler-Utterback bill.

Steel industry's defence of basing point plan scheduled to begin on Thursday.

proper thing even for the rather heterodox New Deal... Probably there are certain fundamentals of political style that can't be outmoded even in these days when the brain trust would have the country believe that the algebraic theorem that things equal to the same thing are equal to each other is a hocuspocus. . . .

Anyhow, the New Dealers shouted recovery. . . . That was the key of all their blasts. . . . The blessings the New Deal has lavished upon the country and business were set forth extensively. . . . Prior to its advent the country was headed for the bowwows. . . . And even the most bitter opponents of the New Deal will have to acknowledge that the country was in a desperate condition. . . . Many of them, too, will admit that for a short time immediately after inauguration the New Deal functioned well, especially in its handling of the banking situation. They do insist, however, that slow improvement had started in June, 1932, and that had the incoming Administration cooperated with the Hoover regime the upswing would have continued uninterrupted.... Certainly a vast section of business, big and little, has failed to observe the blessings, with certain exceptions, of which it has been a beneficiary. A strong conviction to the contrary prevails, just as does the conviction that much of the recovery has come about in spite of rather than because of the New Deal...

Nevertheless, the New Deal has the correct political angle in emphasizing recovery . . for never has a President been defeated for reelection when business was on the upswing. (But, for that matter, no President has been elected over solid business opposition.) . . . Hence the anxiety to see business recovery continued and accelerated, as well as the natural desire to see the nation prosperous and happy and unemployment and relief rolls reduced to the minimum. . . . This desire is shared universally, and the interminable question of having industry absorb greater employment is one of the major matters now receiving the attention of the Administration. . . . For, despite the enticing picture of recovery that is being painted on the easel,

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trols and table working height are definite factors resulting in fast operation and quick work handling. We suggest that you investigate this new milling machine. Call in our representative in your territory, or get in touch with us. Write for illustrated booklet today!



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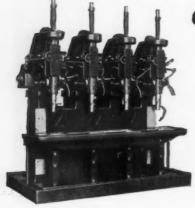


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CUTTER SHARPENING MACHINES CENTERLESS GRINDING MACHINES
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it is badly blurred. . . . Some 11,000,000 or 12,000,000 are still unemployed, and the national debt is reaching unprecedented proportions, with the spending orgy abated hardly at all. . . . Strikes are spreading with increasing rapidity, and business is greatly concerned over these things which have built up strong anti-New Deal sentiment. . .

The greatest source of unemployment is in the capital goods industries. . . . This being so, it would seem the logical, as well as the sound political thing, to encourage them and pay less attention to attacks on big business, "the greedy minority," etc., by means of generalities rather than striking against specific ills where they exist, whether in big business, little business, labor, agriculture or any other section of the national life. . . . Or of playing to certain classes and groups while attacking other groups merely because of size. . . .

What Is Expected From Taxes

But while eager to see business go forward, the Administration is urging a radical revision of corporate taxation which is being widely condemned as a blow to recovery. . . . Smacking of a "reform" measure, it is being criticized as another method of "soaking the rich," as an effort to decentralize big business, and as the raising of funds to pay for agricul-

tural relief. . . . It is the view that it will strike hardest at the capital goods industries, whose increased operations are so necessary to absorb more unemployment. . . . This "share the wealth" idea proposes to levy taxes upon corporate income so as to prevent the accumulation of surpluses. . It is the conception that they should be distributed and passed along to stockholders as dividends. . . . It is estimated that the taxes would yield some \$1,752,000,000, graduated at perhaps 25 to 40 per cent on undistributed profits. . . . The contention is made that corporate surpluses have been used for speculative purposes and that such use has been a major cause of depressions. . . . But if distributed among stockholders, it is maintained, such speculation would be avoided, wages would be increased and purchasing power expanded. . . .

These points, however, do not take into consideration the fact that is now being repeatedly emphasized that surpluses have been a most important cushion used by industry to absorb employees who would otherwise be idle and on Federal relief. . . . Reserves likewise have been drawn on for the same purpose. . . . Surpluses and reserves are used for plant expansion and improvement and for the buying of new equipment, the benefits of which have exceeded the ill-effects of over-expansion. . . These funds used in lean years have obviously greatly relieved the

shock of unemployment or reduced wages and the wiping out of purchasing power. . . . Yet a program is being urged which runs counter to these essentials right in the face of Administration emphasis on the importance of full business recovery and the building up of unemployment reserves such as those required under the social security act. ... Whatever inequities may occasionally grow out of the withholding of dividends from stockholders, the proposed remedy is disturbing members of Congress, who are really dazed over the whole program, though ready to vote for . Some maintain that the withholding of dividends when they are available is not a common but rather an exceptional practice. They realize, too, though for political reasons they are not advertising the fact, that if stockholders were given carte blanche as to the use of reserves they would often "milk" companies in their insistence upon dividends, leaving little or no reserve or surpluses for lean days and use in improving or expanding their plants. . . . Such a development, it has been pointed out, would place corporations in the position of seeking funds for necessary plant improvements and expansion or other purposes by means of bond issues or other obligations that would increase fixed charges. . In the case of some of the smaller, though strong concerns, the opinion has been expressed that they often would be unable to sell securities. . . It is also argued that, at a time when recovery is under way and the need for modern equipment or expansion is essential as a competitive force, the tendency should be to maintain liquid surpluses while distribution of dividends, which would otherwise be deferred, would not be the factor claimed for the plan in the way of increasing employment and purchasing power or investment. . . .

The President has said that the present law makes certain provisions for reserves but the Administration has not as yet indicated what sort of a reserve cushion it has in mind, if any, with respect to the pending program. . . . It is assumed that the Administration does propose to have exemptions against taxation for reserves up to a certain amount of earned income. . . . Representative Vinson's proposal for a 20 per cent exemption has been received with considerable approval by some corporate interests. . . . While not in favor of the revised tax program, they think such an exemption would have substantial, even if inadequate, protective qualities against dissipation of reserves. . . . The present plan also is not to touch corporation reserves already built up. . . . Prevailing Federal corporate taxes would be eliminated. . . . This tax would rest upon dividends when distributed to stockholders. . . .

The President's statement that Treasury estimates show that over \$4,500,000,000 of corporate income will be withheld from stockholders in 1936, has heen challenged. . . . Meanwhile, his estimate of income from the proposed corporate taxes has been hiked by Treasury experts before the House Subcommittee on Ways and Means from \$1,620,000,000 to \$1,752,000,000.... Commissioner of Internal Revenue Helvering in submitting this latter figure also told the subcommittee that repeal of the existing corporate income, capital stock and excess profits tax is estimated to result in a net loss of \$1,132,000,-000 rather than \$994,000,000, the amount stated in the President's message. . . . It was estimated by Commissioner Helvering that in the present year the aggregate taxable corporate income would be \$8,308,-000,000; that \$3,540,000,000 would be paid out in dividends and \$4,-768,000,000 would be withheld for reserves, the latter also a revised figure above the President's estimate which previously was attacked as being too high. . . . An estimate of \$7,200,000,000 was made as the statutory net income for 1936. . . .

While Treasury experts have submitted numerous sources of taxation, indications are that none of them will be adopted. . . . The ideas of a general manufacturers' sales tax, of lowering income brackets, of adding to the nuisance taxes evidently are out of the picture during the present session of Congress. . . . They are a source of fright to politicians. . . . Speaker Byrns has said that there will be no general revision of the tax structure at this session. . . . The alibi is that "the time is too short." The Speaker also said that there will be no change in income tax rates, and if further evidence were needed that the Administration program has been greased ready for the shove-off, it was forthcoming from Chairman Doughton of the Ways and Means Committee. . . . While, with other Administration supporters, Mr. Doughton was considerably upset when the program was projected, he has fallen entirely in line with it now. . . . The so-called threatened revolt died a-borning, and instead of choking over it, Administration supporters have swallowed it whole and even are touting it over the air. . . .

Apparently it is believed John





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Q. Public won't be able to see the hidden taxes which inevitably will fall on him. . . . The pill will be sugar coated but the public will have to take it, with still more to come after the election is over. . Mr. Doughton now finds that the tax program is the key to the whole problem of taxation... He told his radio audience that the excessive accumulation of current earnings by corporations "is the biggest leak in our tax system." . . . Then the customary lip service was paid to the little man with the statement that this accumulation "operates to cause great artificial consolidations of capital and disregard of the interest of small stockholders."

As an epilogue to Mr. Doughton's observation, the following from Representative Snell, minority leader, is offered:

"The President's tax suggestions to Congress present but one more verse in the New Deal's unchanging tune—soak the saver. But the national budget cannot be balanced by political vengence. No matter where the taxes are levied, every man and woman in the nation pays them."

FHA Modernization Plan Aids Equipment Buying

More than 29 per cent of the funds loaned under the amended National Housing Act, permitting owners of manufacturing plants and similar establishments to borrow up to \$50,000 under the modernization credit plan went for building repairs and machinery and equipment during the first six months' operation of the plan. As of Dec. 31, 1935, \$1,360,000 has been spent on buildings and \$1,648,000 for machinery and equipment.

Railroads Urge Continuance of Freight Surcharges

In urging continuance of the present emergency freight rates at Interstate Commerce Commission hearings, railroads have emphasized that the surcharges are urgently needed to aid in meeting "to some extent the increased operating expenses resulting from heavier labor and material costs.' When the hearings were begun last Wednesday before Commissioner Aitchison, this contention was made by Dr. Parmelee, director of the Bureau of Railway Economics of the Association of American Railroads. It was one of the key arguments made by subsequent railroad representatives of carriers throughout the country. Dr. Parmelee filed an exhibit which showed that gross expenditures for additions and betterments to railroad property in 1935 were far below those of the years prior to the business depression, owing to the financial conditions of the carriers. Such

expenditures, according to Dr. Parmelee, amounted to only \$188,302,-000 in 1935, which was less than in the preceding year and was nearly \$700,000,000 less than in either 1929 or 1930.

Opposition to continuance of the emergency rates, which the carriers want to make permanent, came from producers of raw material, especially coal operators, who say that of the \$105,000,000 which it is estimated the rates produce annually, coal paid about 30 per cent. Opposition to the surcharges also has been made by the Lake Superior Iron Ore Association. Annual increase in operating costs was estimated by Charles E. Denney, President of the Erie railroad, speaking for carriers in the eastern district, at \$260,000,-000. Of this, he said, \$160,000,000 results from the restoration of 10 per cent deduction in wages of employees and about \$100,000,000 from an increase in the unit prices of materials and supplies. This, it was pointed out, leaves a shortage of \$155,000,000 that must be made up from other sources.

Mr. Denney said that the necessity for continuation of the surcharges is further shown by the fact that wages in 1936 will be on a higher average level because the full 10 per cent restoration was not effective throughout 1935 and "because price levels of materials and supplies will be as high if not higher in the current year than in the past calendar year." He said that there is little question but that the railroads should spend more than is now being spent on maintenance of way and maintenance of equipment.

Mr. Denney also said that railroads are confronted with higher costs under the social security act, effective Jan. 1, 1936, fixing a charge of 1 per cent on railroad payrolls during the current year and estimated to cost \$16,000,000. This cost, it was pointed out, will be further increased in succeeding years. In addition, Mr. Denney said, the railroad retirement act imposes a tax of 31/2 per cent on wages not in excess of \$300 a month, effective March 1, this year, and that, it was said, will add a further cost of operation of about \$57,000,000 for one year.

These and other added charges were called to the attention of the commission by other witnesses, including R. V. Fletcher, general counsel of the Association of American Railroads. Mr. Fletcher said that there have been comparatively few complaints from the shipping public against payment of the emergency rates. Most of the complaints, he said, have been

directed against inequalities in the rates on competing articles. When these complaints have been found to be well grounded, it was stated, corrections have been made.

C. E. Johnston, president of the Kansas City Southern, speaking on behalf of western carriers, said that the "absolute need for more revenue by the railroads is re-flected in the record of bank-ruptcy." There are, he said, 72,-084 miles of railroads in the United States in receivership or reorganization proceedings. He said that in addition to an accumulation of deferred upkeep of locomotives and cars, railroad expense is increased due to increased age of equipment in stock and deferred retirement. This was said to operate directly against economy and efficient service. He declared that no small part of the loss in railroad traffic to other forms of transportation during the past few years is occasioned by the fact that railroad service has been curtailed in many instances beyond the limit of that necessary to satisfy shippers. He insisted, however, that the railroads have not been dilatory in working out meritorious economies.

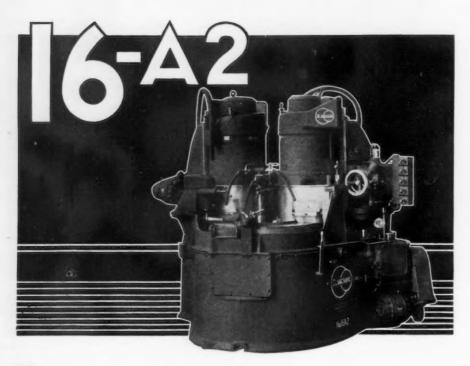
"With a greatly weakened machine brought about by financial reverses and difficulties and having more or less an accumlated obsolescence, the railroads are naturally handicapped from the start in making further economies," said Mr. Johnston.

Richberg Defends Basing Point System

Donald R. Richberg, former national recovery administrator, now practising law in Washington, in a letter to the Washington News, Scripps-Howard publication, has sharply challenged criticism of NRA as a protector of monopoly by John T. Flynn, who conducts a column in the Scripps-Howard chain of papers, and taken particular issue with Mr. Flynn's statement that under NRA steel makers were permitted to get together to revive the old Pittsburghplus basing point system of selling steel.

"The fact is that when the single basing point system—called Pittsburgh-plus—was outlawed by the decision of the Federal Trade Commission, the steel manufacturers throughout the country adopted a multiple basing point system, which had been in operation for many years before the NRA without any Governmental restraint," said Mr. Richberg. "The steel code, as originally approved, permitted continuance of the existing system for a 90-day trial period. The





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operation of the basing point system was then carefully studied by NRA officials with the aid of economic and legal advice furnished by impartial and outstanding authorities in the universities.

"As a result, the NRA recommended drastic modifications of the basing point system to be gradually made effective so as to prevent a sudden disorganization of the entire industry.

"To anyone who understands this subject, the location of basing points for price quotation in a producing area is a sound and fair business practice. On the other hand, the maintenance of artificial basing points is subject to many criticisms and is tolerable temporarily only to avoid the greater

evil of a drastic change in existing conditions, which do as much harm to labor and consumers as to the producers."

Instead of being a protector of monopoly, Mr. Richberg said the major effect of NRA was to give to small business and to labor protection against monopolistic practices which had never been obtained under the anti-trust laws.

Labor Board Holds Pittsburgh Hearing

THE Jones & Laughlin Steel Corpn., Pittsburgh, withdrew from the recent hearing before the National Labor Relations Board when the latter refused to accept the company's position that it was not engaging in interstate business. The board continued taking testimony from the witnesses of the Amalgamated Association of Iron, Steel and Tin Workers. The hearing is ended and the board has moved to Washington, where it will study the testimony before handing down a decision.

The employee election scheduled for March 5 at the Monessen and Allenport, Pa., plants of Pittsburgh Steel Co. has been postponed due to a temporary injunction granted by the Court of Appeals in Philadelphia. Arguments will probably be heard in a week on a permanent injunction which might cause the Court of Appeals to pass on the constitutionality of the Wagner Law.

Propose Revision in Metal Lath Standards

THE standing committee in charge of Simplified Practice Recommendation R3-28, metal lath, has submitted a revision of the recommendation with the request that the Division of Simplified Practice, National Bureau of Standards, refer it to all interests for their consideration and approval. This recommendation, as first promulgated in 1924, established a simplified schedule of stock sizes and varieties of metal lath of the flat expanded, %-in. rib-expanded, and flat rib-expanded types. The program was revised in 1928, and was reaffirmed in that form, in 1935, subject to early review by the standing committee to establish a basis for another revision.

The present proposal, which has been approved by the Metal Lath Manufacturers Association, covers several changes both as regards the elimination of certain items listed in earlier editions of this recommendation, as well as the addition of other weights and varieties of the 34-in. rib-expanded lath. Varieties of metal lath galvanized after fabrication are recommended for elimination.

After adoption by the industry, the revised recommendation will remain in effect until it is again revised by the standing committee, on which occasion all interests will again be circularized.

Copies of the proposed revision, in mimeographed form, may be obtained from the Division of Simplified Practice, Bureau of Standards, Washington.

68-THE IRON AGE, March 12, 1936

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- Use NATCO "HOLEUNITS" in building your drilling, boring, and tapping equipment. They make possible the building of highly specialized machines for high production—yet they are standard in every respect. NATCO "HOLEUNITS" are flexible and interchangeable-are completely self-contained and no connections other than electrical are required.
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- Illustrated at the right is a six way NATCO machine —distinctly a single purpose machine built to per-form a number of drilling and reaming operations on a forged steel crankshaft—yet the machine is built of standard NATCO "HOLEUNITS". Investigate these "HOLEUNITS" today. They are built in a variety of sizes and capacities. Call, write or wire for a NATCO representative today.



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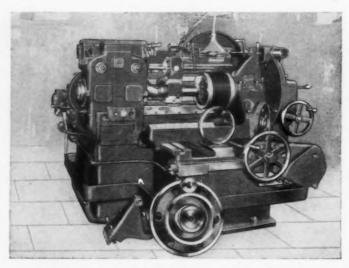
Drilling, Boring and Tapping Machines

• Competition is forcing many manufacturers be the judge as to whether they can save you to reduce production costs. Beat competition and lower your costs now. NATCO Engineers will be glad to study your drilling, boring, and tapping problems. Without any sort of obligation on your part we will make a careful survey and

money. Send in your prints or call a NATCO representative today.

• Chicago Office, 2009 Engineering Bldg., 205 W. Wacker Drive. Detroit Office, 409 New Center Bldg. Factory and Home Office, The National lay our recommendations before you-then you Automatic Tool Co., Richmond, Indiana.





Installation of a size 2-B Sykes Gear Generator and some of the work that is produced by it. Capacity 0 to 25" dia.; 0 to 8" face; 24 to 3 D. P.; maximum cutting strokes 700 per minute.

The FARREL-SYKES GEAR GENERATOR

An
Achievement
in
SPEED
PRECISION
FLEXIBILITY

We have recently published a book describing the Sykes process of gear generation, the design and construction of the machines, their application, operation and many other details of interest to engineers and operating executives. A copy will be sent free to such executives who request it on their company letterhead.

In addition to the Sykes continuous tooth herringbone gear, Sykes machines will generate any known type of herringbone gear straight tooth and single helical gears with internal as well as external teeth and a variety of toothed forms and special contours.

They are the most universal of gear generating machines and do a wider range of work with greater facility, speed, accuracy and economy than is possible by any other method.

FARREL-BIRMINGHAM COMPANY, INC.

333 Vulcan St., Buffalo, N. Y.

Basing Point System Is Violently Attacked at Initial Hearing on Bill

ASHINGTON, March 10.—With his fire directed chiefly at the iron and steel industry, Dr. Frank A. Fetter, professor emeritus of Princeton University, now visiting professor at the University of Illinois, strongly condemned the basing point system yesterday before the Senate Committee on Interstate Commerce. Dr. Fetter's testimony opened the hearings on the Wheeler-Utterback anti-basing point bill. Much additional evidence is to be presented

when hearings are resumed Thursday on the long sharply disputed question which has been the object of prolonged governmental hearings and studies.

At that time Senator Wheeler announced that the steel industry will be afforded an opportunity to present its opposition to the bill. He said that he had invited President William A. Irvin of the United States Steel Corpn., and Walter S. Tower, executive secretary of the American Iron and

Steel Institute, to testify. Others asked to appear before the committee are Donald R. Richberg, former National Recovery Administrator and a member of the defunct steel code authority, and Government officials. The latter are Harold L. Ickes, Secretary of the Interior and Public Works Administrator; J. R. McCarl, Comptroller General of the United States, and Joseph B. Eastman, Federal Coordinator of Transportation.

Senator Wheeler, who is chairman of the Committee on Inter-state Commerce, said Mr. Richberg had been invited to testify because as National Recovery Administrator he approved the basing point system set up in the steel code. Mr. Ickes was asked to appear because, it was pointed out, as Public Works Administrator, he had come into contact with basing point practices. It is assumed that Mr. McCarl is to be called because of legal questions coming before him as they concern bids on Government contracts. Presumably Mr. Eastman is to testify as to the effect basing point systems have on cross hauling.

Dangers of eliminating the basing point system in the steel industry were pointed out by Senator Davis of Pennsylvania, a member of the committee. Quoting letters of protest against the bill from B. E. Kibbee, executive vice-president of the Sharon Steel Corpn., and E. R. Crawford, president, Mc-Keesport Tin Plate Co., Senator Davis said abolition of the basing point system would disrupt the entire industry, destroy steel plants in his section (Pittsburgh), and create widespread unemployment and ruin property values. Dr. Fetter dismissed this suggestion with the statement that such a result was only a "prophecy" on the part of the steel industry and added that "Wall Street would suffer." Senator Davis replied that he was not talking about the "ticker," but was discussing the practical and harmful effect enactment of the bill would have.

In addition to Senators Wheeler and Davis, other members of the committee at the hearing were Senator Dieterich, Democrat, Illinois; Senator Shipstead, Farmer-Labor, Minnesota; Senator Truman, Democrat, Missouri; Senator Neeley, Democrat, West Virginia, and Senator Couzens, Republican, Michigan.

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The majority of the members of the committee who questioned Dr. Fetter are hostile to the basing point system and altogether sympathetic to his attacks on it. Some of the Senators took occasion to comment freely, though clearly with lack of understanding, against the system, contending that it

70-THE IRON AGE, March 12, 1936



design, the facilities to produce. For

stampings in production quantities. call in our engineers for counsel.

ENGINEERING - DESIGN - PRODUCTION SERVICE IN PRESSED STEEL

worked serious hardships on consumers, including small enterprises and agriculture.

Dr. Fetter was called because he was economic adviser to the Federal Trade Commission in connection with the commission's investigation of the "Pittsburgh-plus" The basing point system system. was assailed by Dr. Fetter as being "monopolistic" and pointed ing phrases were used in referring to "Desperation tempered by evasion," "Conceived in sin and born in iniquity," "An economic Alice in Wonderland" and other choice rhetorical tidbits generously sprinkled his extemporaneous testimony.

Dr. Fetter conceded, however, that he does not know everything there is to know about the basing point system. Admonishing the committee to keep this fact in mind, he observed that he had a birthday Sunday and that "if I went on for 70 years I might understand it." He assured the committee that his interest in the subject was the same as that of any other citizen.

The steel industry, Dr. Fetter said, apparently was the first industry to employ the basing point system. Tracing the movement, he gave his opinion of how it had spread both within the steel industry and in other industries.

Taking a crack at the NRA, Dr. Fetter said the steel industry applied the basing point system under the Blue Eagle much the same as before with some increase in basing points and revision of differentials. The steel code, he declared, authorized and legalized "a shady and doubtful practice." Attacking basing point systems generally, he blamed them for causing waste in Probably crosstransportation. hauling in the steel industry, he stated, is greater than in other industries. He estimated that the actual waste in cross hauling amounts to \$1,000,000,000 a year.

"Wouldn't this legislation throw many thousands of railroad employees out of work?" asked Senator Couzens.

"I do not see how I can answer that question except affirmatively," replied Dr. Fetter.

Senator Shipstead interpolated the remark that steel is sold in Minnesota at the Pittsburgh price plus freight, despite the fact that Minnesota has a steel plant at Duluth. Blame for this alleged practice was laid at the door of NRA. Later the Senator said steel was so sold in Minnesota on either a Pittsburgh or Chicago base. Dr. Fetter said, however, it was not due to NRA. He did not point out that Duluth is a basing point for

steel bars, billets, wire products and fence and sign posts.

Dr. Fetter agreed when Senator Wheeler said that the "steel people drew up their own code" and proceeded to explain the part he took in behalf of the NRA Consumers' Advisory Committee in the study of "monopolistic practices under the steel code." Belittling the result of that study, he said NRA only strengthened the practices and made them legal.

The system of charging delivered prices, without regard to the origin of steel, Dr. Fetter declared, makes the agricultural sections suffer the most. Senator Wheeler referred to letters he said he had received from small manufacturing consumers who said the system would

put them out of business. He inquired if the automobile industry doesn't also suffer. Dr. Fetter replied that he was not sure. The automobile industry, he stated, gets some concessions. He added, however, that the system does lead to the freezing of the economic situation and maintains plants under conditions which no longer hold. He readily agreed with Senator Wheeler's suggestion that the practice likewise freezes prices.

"I believe there is no question on which economists of the world are in closer agreement than that of rigidity of prices is the most difficult obstacle in the way of getting out of the depression," Dr. Fetter declared.

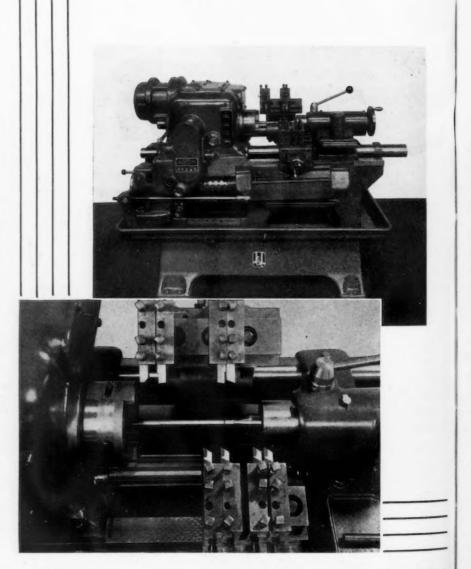
Replying to a question by Sen-

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THE 8-INCH FAY TURNING



JONES & LAMSON MACHINE

ator Couzens, Dr. Fetter said he was not sure that steel and aluminum maintain the most rigid prices. He said, however, that it is surprising how prices have been maintained during the present depression when compared with previous depressions.

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Dr. Fetter dubbed as a "knot hole view" what he said is the practice of industries, such as steel and aluminum, in holding to fixed prices. It was his view that by lowering prices and increasing volume mutual advantage would ensue for both the producers and consumers.

When Senator Shipstead asked "what basing point the Bethlehem Steel Co. quotes on," Dr. Fetter, without seeking to make direct reply, said that he thought the popular impression of expansion of basing points had been exaggerated. This opinion was based on the contention that the expansion has not applied to general but to only specific products.

"I take it that in a capitalistic form of government it is necessary to have free competition," Senator Wheeler suggested.

Quibbling over the term "capitalistic," Dr. Fetter responded that "I think we are playing with fire in interfering with free competition."

"Are we building up private socialism?" inquired Senator Wheeler.

"We are building up extra-legal authority," Dr. Fetter replied.

Discussing the Government's dissolution suit against the United States Steel Corpn., Dr. Fetter said he thought the Government "muffed the ball." He said that the United States Steel Corpn. has the best economic and legal advice while the Government had no economic advice with the result that the basing point practice was not mentioned in the proceedings.

Senator Neeley inquired as to what the basing point system in the steel industry added to the cost of consumers, and whether it was 5 or 10 per cent or more. Dr. Fetter said he could give no arbitrary estimate. He stated, however, that it has the effect of "crystallizing the geographical situation."

Senator Davis asked if it was the understanding that consumers in the automobile industry would benefit if all prices were based on Detroit. Dr. Fetter stated that he had not said it would.

Referring to the letters of proest against the bill from the Sharon Steel Corpn. and the Mc-Keesport Tin Plate Co., telling of the disruption its enactment would cause in the industry, Senator Davis asked if Dr. Fetter thought Pittsburgh was the right place to price certain products, including tin plate.

"Of course, Pittsburgh is greatly overbuilt," replied Dr. Fetter.

Senator Davis said the whole industry was overbuilt. Senator Davis pointed to the statement of President Crawford of the Mc-Keesport Tin Plate Co. that if the bill were enacted it would have the effect of disrupting the industry, placing a premium on locating industries at regions of greatest consumption, rather than at sources of raw materials, etc., at great economic waste.

"Shifting population would be another wasteful result of this," Mr. Crawford pointed out. "To be considered is the fact that areas of consumption are constantly changing and the same situation arises again."

Mr. Kibbee in the course of his letter declared that "a program such as is outlined in the Wheeler bill can only result in a great realinement of the steel industry, i. e., in the abandonment of many mills in present locations and the concentration of new mills adjacent to or directly in the large consuming centers for their products, such as Detroit and Chicago, with the resultant concentration of greater population in certain areas and the throwing out of work of tens of thousands of employees in the various smaller communities where mills are now operating."

BOLSTERS FOR TEXTILE MACHINERY



Always a versatile machine, the 8" Fay Automatic Lathe has, of course, found its way into the textile machinery trade. This industry, along with others, has found the purchase of this machine justifiable, because, combining ease of operation with multiple tooling, it increases production and quality, and lowers the labor cost per piece.

The tooling possibilities of the larger Fay Lathes are incorporated in this machine. Multiple tooling may be arranged on the carriage and the back arm, and a third cutting head may be installed for cutting and facing. This universal machine is completely automatic in cycle.

illustrations on opposite page show an 8" Fay Lathe and the tooling used for turning bolsters for textile machines. The rough forg-

ings are mounted on conters. In one machine cycle the carriage finish turns and the back arm finish forms. Using cemented carbide tools, a spindle speed of 1120 R. P. M., and a feed of .008, a floor to floor time of 30 seconds is obtained.

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Your purchase may be financed on F.H.A. Terms through the Equipment Acceptance Corporation. Low rate, long term, monthly payments. Your working capital left untouched.

COMPANY, Springfield, Vermont, U.S.A.

THE IRON AGE, March 12, 1936-73



NEWS OF THE WEEK

Steel Ingot Production Declines in February, but Operating Rate Rises

BESSEMER and open-hearth steel ingot production in February declined to 2,967,803 gross tons from 3,049,439 tons in January, according to the American Iron and Steel Institute. During February of 1935, however, only 2,777,765 tons was produced.

On a daily basis last month's output increased, because February contained 25 working days to 27 for January. Daily production was 118,712 tons and 112,942 tons respectively while one year ago it

was 115,740 tons. Operations for the month were at 54.09 per cent of capacity, compared with 51.46 per cent in January and 52.28 per cent a year ago.

Bethlehem Steel Sales Rise to \$210,000,000

Corpn. during 1935 were substantially greater than in 1934,

according to the company's annual report to stockholders. Total income for 1935, after deducting all charges, except depletion and depreciation (other than depreciation charged to operating expense), was \$18,873,152, compared with \$14,330,210 for 1934. After deducting \$14,581,899 for depletion and depreciation, net income amounted to \$4,291,253, as against \$550,571 for the preceding year.

Net billed value of products shipped and of other classes of business done during the year came to \$192,836,148, compared with \$168,207,394 for 1934. The estimated net amount of business booked during the year aggregated \$210,033,718, in contrast with \$157,340,326 for the preceding year. The estimated net billing value of unfilled orders on hand Dec. 31, 1935, totaled \$74,015,251, compared with \$56,817,681 a year earlier.

Taxes levied upon the corporation in 1935 increased nearly \$1,400,000 over the 1934 assessment. The total amount of such taxes incurred by the corporation was equivalent to \$8.04 a share of preferred stock. Total dividends paid on the preferred stock during 1935 amounted to \$3.50. No dividends were declared or paid during the year on the common stock. The unpaid dividends accrued on the preferred stock, after deducting the above-mentoned distribution, amounted to \$19.25 a share.

Cash available at the end of 1935 equalled \$31,819,219, corresponding to \$50,874,981 for 1934. Cash expenditures for additions and improvements to properties during the year amounted to \$24,104,024, and the net reduction in the funded debt was \$14,941,495. The figure of \$31,819,219, representing bank demand deposits and marketable securities, includes \$232,455 for matured interest coupons and dividend drafts not presented for payment at the end of

REPORTED BY COMPANIES WHICH IN 1934 MADE 97.91 PER CENT OF THE OPEN-HEARTH AND 100 PER CENT OF THE BESSEMER INGOT PRODUCTION

Reported Production

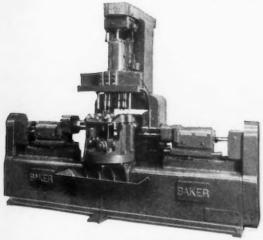
Calculated

	(Gross	Tons)	Monthly Pro	oduction-	of Work-	Per Cent
1934	Open- Hearth	Bessemer	Monthly	Daily	ing Days	of Opera- tion
January February March April May June	1,786,458* 1,993,465* 2,540,243* 2,622,531* 3,003,676* 2,718,782*	$172,489 \\ 175,873 \\ 203,904 \\ 257,482 \\ 331,620 \\ 282,592$	$\begin{array}{c} 1,997,129\dagger\\ 2,211,944\dagger\\ 2,798,440\dagger\\ 2,936,064\dagger\\ 3,399,494\dagger\\ 3,059,483\dagger\\ \end{array}$	73,968† 92,164† 103,646† 117,443† 125,907† 117,672†	27 24 27 25 27 26	33.59† 41.86† 47.07† 53.34† 57.18† 53.44†
July August September October November December	1,340,924* 1,245,139* 1,127,269* 1,325,777* 1,447,626* 1,794,437*	119,869 109,598 117,615* 127,789 132,059 131,467*	$\substack{1,489,453\dagger\\1,381,350\dagger\\1,268,977\dagger\\1,481,902\dagger\\1,610,625\dagger\\1,964,257\dagger}$	59,578† 51,161† 50,759† 54,885† 61,947† 78,570†	25 27 25 27 26 25	27.06† 23.24† 23.05† 24.93† 28.13† 35.68†
Total	22,946,327*	2,162,357*	25,599,118†	82,312†	311	37.38†
1935						
January February March April May June	2,576,671 2,500,062 2,582,211 2,358,249 2,331,297 1,978,180	239,858 224,336 230,810 231,916 254,796 210,487	2,871,531* 2,777,765* 2,868,141* 2,640,504* 2,635,857* 2,230,893	106,353* 115,740* 110,313* 101,558* 97,624* 89,236	27 24 26 26 27 25	48.04* 52.28* 49.83* 45.87* 44.10* 40.31
July August September October November December	2,003,011 2,629,828 2,541,840 2,815,624* 2,840,451 2,793,746	224,456 233,361 233,737 270,719 252,163 228,425	2,270,224 2,919,326 2,829,835 3,146,446* 3,153,247 3,081,807	87,316 108,123 113,193 116,535* 121,279 123,272	26 27 25 27 26 25	39.44 48.84 51.13 52.64* 54.78 55.68
Total	29,951,170	2,835,064	33,425,576	107,478	311	48.55
1936						
January February	$2,793,421 \\ 2,707,562$	$\substack{196,389 \\ 202,445}$	$3,049,439 \\ 2,967,803$	$\frac{112,942}{118,712}$	27 25	51.46* 54.09
*Revised.						

74—THE IRON AGE, March 12, 1936

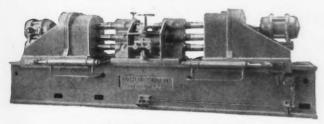
OF "PROFIT BUILDERS" BY BAKER

★ The machines shown below are some of the recent developments by Baker Brothers, Inc., which are speeding up production and lowering costs in automotive plants today.



2 CU Cam Feed Units

An adaptation of Baker units for a four-way tapping operation. These units can be mounted in any desired arrangement or combination. Being self-contained, the units can be salvaged and used in different arrangement.



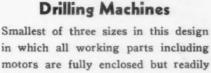
25 EH Hydraulic Feed

Two-way boring application for tractor transmission case. The machine can be furnished with different length bed, and any desired combination of spindles in each head. Each head is fed by our unique double cylinder construction.



No. 3 Contour Grinder

Especially designed for grinding and polishing dies, cams and irregular shapes. While revolving, the spindle automatically reciprocates vertically insuring long wheel life and uniform wear. Table can be tilted for grinding angles.



10 HO Hydraulic Feed

accessible for adjustments. Available in single or multiple spindle types, with plain or indexing table.



75 HO Hydraulic Feed Drilling Machines

A standard machine equipped with twelve spindles, and a four station, automatic indexing table. Furnished for drilling, boring and reaming crank and pin holes in connecting rods. Each fixture designed for holding two rods.



217 Gear Feed Drilling Machine

One of nine sizes of standard heavy duty drills. This machine is equipped with multiplehead for drilling steering gear housing.



Present your problems in drilling, boring or tapping to

BAKER BROTHERS, Inc.

THE IRON AGE, March 12, 1936-75



could tell all about a machinist by looking in his kit. Good men and good tools just naturally go together so if you saw the Starrett name on most of them you could be sure the machinist knew his job.

"The shoe is kind of on the other The name Starrett stands for foot today. The first thing a new Starrett on most of the shop you buy shop equipment tools,

equipment tools, he knows he's in a good shop."

accuracy, dependability, conman does is take a look at the venience—all the things your tool crib. If he sees the name men value most in tools. When

buy the tools your men would buy for themselves-Starrett Tools. Have you a copy of Catalog No. 25; "AA"? (

YOUR MEN Prefer



the year, but excludes \$40,940,000 reserved for retirement of funded debt maturing in 1936.

No payments were made for the year 1935 to officers of Bethlehem Steel Corpn. and heads of departments having general control of matters as a whole under the modified bonus system. Pensions totaling \$840,255 were paid to retired employees during the year. In addition, 194 new pensions were granted, 169 were terminated by death or other causes, and at the year's end 1921 retired employees were on the pension list. Sick or disabled employees, or dependents of deceased employees, as provided for under the corporation's Relief Plan, claimed \$1,007,107 in pay-The burden of meeting

these pension and relief obligations did not fall entirely upon 1935 earnings, however. Permanent funds have been set aside, which claim each year a certain amount of the company's earnings.

The daily average number of employees of the company in the United States working during the year, excluding Saturdays, Sundays and holidays, was 50,552, as against 44,430 in 1934. Average earnings per hour of these employees, excluding administrative and selling forces, was 70.7c., compared with 67.4c. during 1934.

The number of stockholders of Bethlehem Corpn. at the end of the year was 78,523, of whom 3321 held both preferred and common stock. Preferred stockholders numbered 30,204 and common stockholders 51,640.

Operations of the corporation and its subsidiaries during 1935 averaged 39.8 per cent of rated steel capacity, compared with 34.9 per cent in 1934. Little change occurred in the operating rate until the last quarter, when a noticeable increase was felt.

To Reduce Scrap Insurance Costs

A PLAN for the reduction of compensation insurance costs in the scrap iron industry and to take the scrap dealers out of the "junk" classification, in which they are now placed in insurance classification, has been announced by Benjamin Schwartz, director general of the Institute of Scrap Iron and Steel. With self-insurance as the fundamental principle, a pooling of services has been perfected with the following specific features:

1. A "stop-loss" policy is secured, which guarantees that the total cost for compensation or employers' liability, including the fixed cost for service and reinsurance premium, will not exceed the normal premium.

2. A completely equipped service organization is provided with branch offices in principal cities, to handle the administrative details and to service the employer in every respect, including investigation of claims, filing of required reports, appearances before proper authorities, inspection and safety engineering work, maintenance of records, representation in rate reduction procedure, etc. A service organization has been incorporated under the name of Scrap Materials Service Corpn., under the direction and control of the institute.

Compensation insurance represents the heaviest operating tax on the scrap dealers' payroll today, according to Mr. Schwartz. The basic rates have been increasing from year to year and further increases are in prospect in practically every State. At present, compensation insurance rates for scrap dealers range from approximately \$9 per \$100 of payroll in Alabama to over \$26 per \$100 in New York. average rate for scrap dealers throughout the United States is approximately \$15, an increase of approximately 20 per cent over five years ago.

The long-range program formulated by the institute for its members has the following objectives:

1. To reduce the present cost of compensation to approximately a "cost plus" basis, by eliminating a substantial part of the insurance campaign overhead.

2. To eventually reduce the basic rates for the scrap industry in the various States, by centralizing the actuarial experience of the industry and properly presenting the facts to the rate-making authori-

3. To render a continuous safety engineering service, so that any benefits which may be obtained may be preserved and increased from year to year.

Republic Steel Not Acquiring Wickwire

RUMOR that the Republic Steel Corpn. has acquired or intends to take over the Wickwire Spencer Steel Co. is untrue. Republic did not purchase \$3,000,000 worth of the notes of Wickwire Spencer, nor did it make any attempt to absorb, or to get in any position that would permit the control or influence of Wickwire Spencer policies.

For some years the reciprocal relations between both companies have been advantageous to both and may be continued.

The basis of the rumors which have appeared in public print, was the misunderstood testimony of a member of the security company which did purchase the \$3,000,000 worth of notes.

Will Rebuild Cold Metal Process Plant

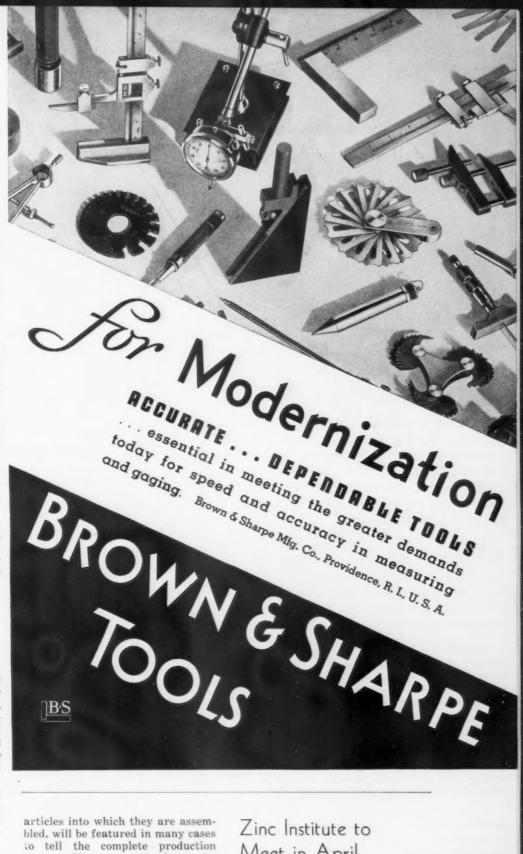
THE plant of the Cold Metal Process Co., Youngstown, maker of rolling mills for steel plants, was destroyed by fire with an estimated loss of \$500,000. Included in the loss were two completed Steckel 20-in. rolling mills, two 8-in. mills, and one 20-in. mill in the process of construction.

The company plans to rebuild the plant at once, and there will be no cessation of shipments of strip steel which the company produces.

Die Casting Institute To Hold Exhibit

THE American Die Casting Institute will hold an extensive exhibit of die castings and die-cast products at Metal Products Exhibits, Inc., International Building, Rockefeller Center, New York, beginning March 16.

Enlarged production photographs, the die castings and the



bled, will be featured in many cases to tell the complete production story. Many new products designed for die castings will be assembled: washing machines, industrial machinery, home workshop tools, mantel clocks and children's toys will indicate the range of applications of zinc, aluminum and brass die castings on display.

With the exhibits which have already been assembled this show will undoubtedly be the most extensive exhibition of die castings ever shown. Twenty-seven commercial die casters are cooperating.

Meet in April

THE eighteenth annual meeting of the American Zinc Institute, Inc., will be held at the Hotel Statler, St. Louis, April 20 and 21. Various activities of the institute will be reviewed, legislation affecting the zinc industry discussed, and the organization and activities of the Air Hygiene Foundation of America, which is studying silicosis, will be described. The program will also include talks and discussions on galvanizing practice.

"WE GOT MORE THAN SILENCE

after installing INSUROK bevel and spur pinions on all of our heavy driving equipment"

*Says an Executive of a large industrial plant.

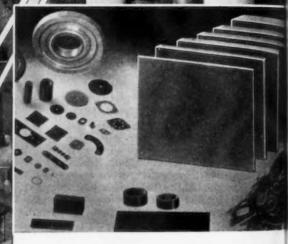
"These Insurok drive pinions have effected "power saving", lowered maintenance costs and improved production efficiency. Our men are able to work to much better advantage now that the bedlam of noise and screech has been reduced to a minimum."

This is just a typical example of INSUROK installations in other plants. Your regular gear cutter can supply you with any quantity of INSUROK gears in the style and of the size to fit your requirements.

Millions of pieces from the tiniest simple designs to the largest intricate precise shapes, some weighing more than a hundred pounds, are molded or laminated every month in the plants of the Richardson organization, the largest in the United States devoted exclusively to the plastic arts.

Richardson can supply your every requirement and you may be assured that you will receive the type and quality of plastic parts especially suited for your requirements.

As custom molders of Plaskon, Beetle, Durez, Bakelite, Resinox, Indur, Tenite, and all forms of synthetic resin plastics, the resources of our Research Laboratories, Design and Engineering Departments are at your command.



INSUROK "a superior laminated pholic product", in sheets, punchings, a blanks, pump valves, fabricated parts grades and thicknesses for countless ap cations. Insurok may be sawed, drill turned, punched, tapped, planed, miled sheared with perfect ease . . . real fabricated in your own factories.

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PERSONALS

FRANCIS HODGKINSON, who was closely identified with Sir Charles Parsons and George Westinghouse in the development of the steam turbine in the United States, has retired from the Westinghouse Electric & Mfg. Co. after 42 years of service. In honor of his retirement he was tendered a dinner by employees of the company's South Philadelphia works at the Racquet Club at Philadelphia. He was born at London, England, in 1867 and was educated in the Royal Naval School at New Cross, England. He was apprenticed in 1882 to Clayton & Shuttleworth, agricultural engineers, Lincoln, England, and in 1885 he became associated with Sir Charles Parsons in the early development of the reaction steam turbine. In 1890 he served the Chilean Navy during a revolution. From 1892 to 1894 he was with the Telephone & Electric Light Co. of Lima, Peru. In 1894 he rejoined C. A. Parsons & Co., as superintendent of erecting and fitting shops. When George Westinghouse negotiated a license agreement with Sir Charles Parsons in 1896, Mr. Hodgkinson at the latter's recommendation started with Westinghouse Machine Co. to initiate the designing and construction of steam turbines. He was responsible for steam turbine construction until 1916 when he was made chief engineer in charge of all steam power apparatus of the Westinghouse Electric & Mfg. Co. In 1926 he was made consulting mechanical engineer for the company, holding that position until his retirement. During this period, he has been the principal United States delegate to the International Electro-Technical Commission.



GARNET P. PHILLIPS and GEORGE ZABEL will present papers on "Selection and Application of Cast Metals for Engineering Construc-tion" and "Engineering in Its Relation to the Foundry" at the joint meeting of the Chicago chapter of American Foundrymen's Association, Western Society of Engineers, and the Chicago section of the American Society of Mechanical Engineers, which will be held March 16 in the Auditorium of the Engineering Building, 205 West Wacker Drive, Chicago. Mr. Phillips is metallurgist, tractor plant, International Harvester Co., Chicago, and Mr. Zabel is chief chemist, metallurgist and foundry superintendent for Fairbanks, Morse & Co., Beloit, Wis.



J. W. LEONARD has been appointed general sales manager of the Cuyahoga Steel & Wire Co., Cleveland. For 12 years he has been connected with the sales department of the Youngstown Sheet & Tube Co. in the Cleveland district.

J. TEDFORD BACHMAN has been named manager of the New York office of the Sharon Steel Corpn. Mr. Bachman is the son of the late Morris Bachman, one of the founders and the first president of the Sharon Steel Hoop Co., now the Sharon Steel Corpn.



J. H. CARTER has been named general superintendent of the Monessen, Pa., plant of the Pittsburgh Steel Co. He has been works manager of the Lowellville, Ohio, plant of Sharon Steel Hoop Co. R. C. BUTLER has been made superintendent of blast furnaces, succeeding George W. Hughes. J. A. Nygren, formerly with the Globe



HOWARD E. ROBIN-SON, who as announced in these columns recently has been elected vicepresident in charge of sales of the Otis Steel Co., Cleveland.



L. M. PARSONS, new manager of sales, Philadelphia district, of the Bethlehem Steel Co., whose appointment was announced in these columns last week.

Seamless Tube Co., Milwaukee, has been named assistant to the superintendent of the Allenport, Pa., plant.

Walter Borges, formerly general manager of a manufacturing plant in Milwaukee, has been appointed special sales representative for the Wrought Washer Mfg. Co., Milwaukee, working under the per-



G. P. PHILLIPS



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THE IRON AGE, March 12, 1936-79



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sonal direction of W. F. DISCH, general sales manager.

. . .

HENRY F. ANDERSON has been made district sales manager in eastern Pennsylvania, southern New Jersey and Delaware for the Atlas Fence Co., Philadelphia, division of the Manganese Steel Forge Co. He will make his head-

quarters at the general offices of the company at Philadelphia.

. . .

FORREST E. SMITH, for the past five years sales manager of the Kensington Steel Co., Chicago, has been elected secretary of the company.

* * *

Dr. John F. Thompson, for the



ROGERS, who has been appointed general factory manager of the Caterpillar Tractor Co., and James R. Munro, who succeeds Mr. Rogers as factory manager of the company's tractor division. Details of their careers were published in these columns last week.

past five years sole vice-president of the International Nickel Co., has been made executive vice-president. Dr. Paul D. Merica, formerly assistant to the president; Donald MacAskill, general manager in charge of Canadian operations, and D. Owen Evans, delegate director of the Mond Nickel Co., Ltd., have been elected vice-presidents.

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M. G. Dumas has been elected president and D. C. Lott, secretary-treasurer, of Steel & Engineering, Inc., Pittsburgh.

. . .

CYRIL GRINDROD, for the past 10 years general foreman in charge of the automatic screw machine, gear cutting and sheet metal departments of Dalton-Powers division, Remington Rand Corpn., Norwood, Ohio, has joined the staff of Union Drawn Steel Co., Massillon, Ohio, in the capacity of sales engineer and consultant to the trade on automatic screw machine operations. Since entering business in 1913 in the screw machine department of Potter & Johnston Machine Co., Pawtucket, R. I., Mr. Grindrod has been constantly associated with automatic screw machine operations. . * *

JOHN W. BLACKFORD, for many years associated with the ball bearing division, the Torrington Co., Torrington, Conn., as factory salesman and Detroit district manager, has joined the sales organization of L. C. Biglow & Co., Inc., manufacturers' sales agent, 250 West Fifty-fourth Street, New York, where he will have charge of the bearings department.

* * *

A. V. DEFOREST, associate professor of mechanical engineering, Massachusetts Institute of Technology, will speak on "Unusual Methods of Inspection" at the next meeting of the Chicago chapter of the American Society for Metals, which will be held March 12 at the Medinah Athletic Club.

. . .

GEN. OTTO H. FALK, chairman of the board of Allis-Chalmers Mfg. Co., Milwaukee, has been elected a director of the Square D Co., Detroit.

FORREST E. McGuire, assistant executive director of the Milwaukee Association of Commerce, has resigned to accept appointment as secretary-manager of the Racine, Wis., Manufacturers' Association to succeed Arthur F. Thompson, who has entered local industry. Mr. McGuire was connected with the Milwaukee Association for 13 years.

EDWARD R. WALSH, JR., has re-

signed as retail sales manager of Gilbert & Barker Mfg. Co., to become general sales manager of the air conditioning and automatic heating division of the Herman-Nelson Corpn., Moline, Ill.

. . .

E. E. REAGLE, superintendent of the Sharon, Pa., plant, Sharon Steel Corpn., has been named general superintendent of all plants, which include mills at Sharon, Warren, Niles and Lowellville. James May, production manager at Sharon, has been named assistant to Mr. Reagle. Walter S. Jackson has been named superintendent to succeed Mr. Reagle, and LLOYD L. WILSON has been appointed superintendent of the strip mill.

W. W. SCHOFIELD has been named superintendent of the Lowellville, Ohio, plant of Sharon Steel Corpn. P. M. Connor has been appointed assistant plant superintendent, and John Bidner, openhearth superintendent. Mr. Schofield has been with the Lowellville plant for 20 years, working his way up from second helper in the open-hearth plant. Mr. Connor is a graduate of Miami University and was chemist and metallurgist for American Rolling Mill Co. at Middletown, Ohio, from 1918 to 1925. He then went with the Newton Steel Co. as chief metallurgist and in 1934 was made works manager of the Monroe, Mich., plant of that company. He joined the Sharon company in 1935. Mr. Bidner received his first steel experience in Germany. He was employed at the Ohio works of Carnegie Steel Co. from 1911 to 1914, when he joined the Brier Hill Steel Co. In 1917 he became a melter at the Sharon Steel Hoop Co.

A. S. T. M. Reviews Construction Metals

(CONTINUED FROM PAGE 55)

popularity as structural materials is slowly increasing, the wrought magnesium-base alloys have not yet achieved large tonnages in this country.

There are four important magnesium casting alloys and all four are subject to improvement in strength by heat treatments similar to those used for aluminum alloys.

Of the three magnesium-aluminum alloys, the one containing 10 per cent aluminum has been used most widely, principally in the heat treated temper. In the heat treated temper the 8 per cent aluminum alloy has been used where maximum resistance to shock was required, and the 12 per cent aluminum



num alloy for maximum yield strength and hardness. The 6 Al, 3 Zn, 0.2 Mn alloy is used very widely in the as-cast condition and, in this form, represents an economical application of the metal in services which require only moderate strength. In the heat treated temper this alloy develops the maximum strength and toughness commercially obtainable and is used in applications where heavy loads and shocks are encountered. This alloy seems to be rapidly supplanting the magnesium-aluminum alloys.

Practically all wrought magnesium alloys are available in the form of extruded shapes and, in this form, can be produced in essentially the same shapes and sizes obtainable in aluminum. At the present time the 1.5 per cent manganese and the 4.0 per cent aluminum-0.3 per cent manganese alloys are the principal ones used in this country for sheets, although the actual tonnage of the latter alloy is considerably greater than that of the former. Alloys containing 6.5, 8.5 and 10 per cent aluminum combined with small amounts of manganese, and sometimes zinc, are usually used for forgings and extruded shapes. The latter alloy, in the heat treated temper, is sometimes employed where maximum strength is required.

Because of the wide use of salt spray in studying the resistance of the light alloys to corrosion-and the severity of this test on magnesium-the magnesium alloys have the doubtful honor of being considered as having markedly inferior resistance to corrosion. As a conclusion for their paper, the authors pointed out that, actually, magnesium alloys' resistance to attack by inland atmospheres is quite good and it is only on continuous exposure to saline conditions that they suffer substantial corrosion. The alloys apparently are not subject to intergranular corrosion. Methods of protecting the alloys from attack by the more severe exposures have been fairly well developed and their use even along the seacoast, when properly protected, now appears practical.

Copper Alloys

The alloys of copper used as constructional metals were described in a paper by C. H. Davis, metallurgist for the American Brass Co. Mr. Davis pointed out that his term "alloys of copper" was to be construed as applying to alloys containing at least 50 per cent copper, with one exception, namely, extruded nickel silver. High strength in copper alloys is entirely relative inasmuch as the range covered extends from the strength of pure

copper at about 30,000 lb. per sq. in. to that of heat-hardenable alloys of over 200,000 lb. per sq. in. tensile strength. A complete picture of the field can only be given by a rapid survey in which the greater stress will be placed on those alloys of greater strength.

Copper itself has many excellent properties, such as high electrical conductivity, corrosion resistance, and ductility. Many of these properties are imparted to some degree to the many alloys, but generally speaking, the increase in strength accompanying additions to copper is correspondingly offset by loss of conductivity and ductility. However, there are exceptions to this observation.

The author simplified his description of copper alloys by breaking them down with regard to the principal alloying agent. The various alloys described were as follow:

Zinc

Because of cheapness and the wide range of useful brass alloys, zinc is the most common and widely used of all the alloying metals. The copper-zinc alloys have two peaks of hardness, one in the vicinity of 72 per cent copper, the other in the higher zinc region where the beta phase lends its strength and hardness to that of the alpha. The physical properties of the brasses are so well known that the simple statement will suffice that the tensile strength ranges from 35,000 to 57,000 lb. per sq. in. in the annealed or soft condition up to approximately 55,000 to 125,000 lb. per sq. in. in the hard-rolled or drawn condition.

There are also infinite possibilities in alloy compositions to be secured by additions of other elements to the copper-zinc series. Most of the combinations for high strength are made to those alloys in the 55 to 60 per cent copper region.

Tin

Bronze containing tin is one of the oldest known alloys. In present practice, approximately 10 per cent tin is considered a maximum for cold working. Alloys of higher tin content have been successfully hot rolled but not on a commercial basis. As the tin content increases, the strength rises to approximately 60,000 lb. per sq. in. in the annealed condition, and to 115,000 lb. per sq. in. or more in the hard-rolled or drawn condition. A favorable increase in elongation accompanies the increase in the tin content, a characteristic that has made the bronzes peculiarly adapted for resistance to fatigue.

Several metals are commonly

added to the copper-tin series, for instance, zinc, nickel, cadmium, and aluminum. Phosphorus is generally employed as a deoxidizer.

Nickel

Mr. Davis' discussion of the alloys of nickel with copper was confined to those having approximately 30 per cent nickel or less. The binary alloys commonly termed "cupro nickel" are readily made in all proportions within the range named. The strength increases with the nickel content up to approximately 65,000 lb. per sq. in. in the 30 per cent alloy annealed, or 85,000 lb. per sq. in. or more when hardrolled or drawn. The color ranges from pinkish to white.

The most widely used and best known alloys of nickel have been those containing a high proportion of zinc. Because of their white color, these alloys have been given a variety of names based upon their likeness to sterling silver. The word "nickel-silver" is now commonly employed. The nickel content is as high as 30 per cent, but averages more nearly 18 per cent. The zinc also goes as high as 32 per cent, but is more generally employed in amounts from 5 to 25 per cent. The nickel plus the zinc both give high strength to these ternary alloys. For instance, Ambrac, containing 30 Ni and 5 Zn, when annealed has a strength of approximately 65,000 lb. per sq. in., and 105,000 lb. per sq. in. when hard rolled. An 18 per cent nickel alloy containing 27 per cent zinc has a tensile strength of 60,000 lb. per sq. in. when annealed and 100,-000 lb. per sq. in. when hard rolled. In like manner, the zinc and nickel both produce whiteness in the al-

Great variety can be secured by the addition of other elements to the copper-nickel and copper-nickelzinc groups. Elements sometimes introduced include silver, manganese, iron, and lead, the last for obtaining free cutting properties.

Aluminum

Additions of aluminum up to 10 per cent to copper increase the tensile strength to approximately 78,000 lb. when annealed and approximately 125,000 lb. per sq. in. when hard drawn. The color changes from red to pale gold. The more common additions that increase the strength and hardness and create other favorable characteristics include iron, nickel, manganese and silicon.

Silicon

Silicon is one of the elements more recently introduced into copper and one that has been given a

very favorable reception among the copper alloys of high strength. The silicon is usually accompanied by a third element, such as manganese in the Everdur developed by the late Mr. C. B. Jacobs. Here the tensile strength annealed is approximately 55,000 lb., hard rolled or drawn from 100,000 to 145,000 lb. per sq. in. Other metals now commonly added to copper and silicon comprise zinc, iron, tin, and aluminum. A copper content of approximately 95 per cent or more is considered desirable in this group of silicon alloys, characterized by having substantially the corrosion resistance of pure copper and the strength of mild steel.

Manganese

The element manganese has long been used, not only alloyed with copper in amounts up to 30 per cent, but as a desulphurizer in brasses and nickel silvers of complex composition. In most cases, such alloys may be classified among those of high strength and resistance to corrosion unless they are employed in a highly stressed condition.

Heat-Hardenable Alloys

Mr. Davis next described various heat-hardenable copper alloys. He stated that during the past few years there have been developed several heat - hardenable copperbase alloys having many desirable characteristics. These alloys have not as yet been manufactured in large tonnage but the distinct trend toward corrosion - resistant materials of high strength is going to require continued development along the lines that even now are well designated. Copper is a most essential element in practically all of the non-ferrous age-hardenable or heat-hardenable alloys. The more common elements used with copper in these heat-hardenable alloys include: aluminum, beryllium, chromium, cobalt, nickel, silicon and tin. Other elements used include iron, palladium, platinum, phosphorus, silver and titanium.

Copper-Nickel-Aluminum

The alloys of nickel and aluminum with copper are readily hot and cold worked within certain ranges. The alloys can be soldered and welded without difficulty. Corrosion resistance is quite high. Typical alloys contain about 91.0 per cent copper, 7.5 per cent nickel, 1.5 per cent aluminum.

Copper-Nickel-Tin

The addition of tin to copper and nickel produces another series of heat-hardenable alloys. The ranges named by E. M. Wise are 21/2 to 20 per cent tin, 31/2 to 50 per cent nickel, and the remainder copper. Those alloys containing less than



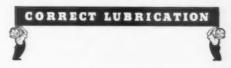
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2½ per cent tin have desirable qualities but are not heat treatable.

Copper-Nickel-Silicon

The heat-hardenable alloys in which the hardening is brought about by the precipitation of nickel silicide were the invention of Michael G. Corson and have been sold under the name "Tempaloy." These, in addition to hardness and toughness, have excellent resistance to wear. They have the strength and other characteristics required for constructional purposes but have not as yet found very much use in that field. The hardening is brought about by reheating the homogenized metal in the range approximately 450 to 550 deg. C.

Copper-Beryllium

Possibly the best known of the recent developments in heat-hardenable copper alloys is that of beryllium-copper. In the range approximately 1.4 to 2.5 per cent beryllium, the copper alloys can be readily worked and then may be hardened and strengthened by heating in the range 250 to 325 deg. C. By such treatments, tensile strengths of over 200,000 lb. per sq. in. may be obtained, though in the annealed condition the alloys are ductile, having a strength of from 50,000 to 70,000 lb. per sq. in. Beryllium-copper is now widely used in certain types of electrical devices as well as in airplanes, where it is employed partly in constructional details, such as landing gears. The present high cost of beryllium is one of the factors that

is now preventing the much wider use of this high-strength corrosionresisting alloy, but it is expected that this price handicap will be lowered appreciably as volume demand increases.

Copper-Beryllium-Nickel

The copper-beryllium-nickel alloys with a beryllium content of less than 2 per cent and a nickel content up to 40 per cent are also a development of Michael G. Corson. The development has not proceeded far, but the properties, such as the tensile strength annealed of 48,000 lb. per sq. in., with 60 per cent elongation in 2 in. up to 90,000 lb. per sq. in., 15 per cent elongation in 2 in. in the heat-hardened condition, show that these alloys have possibilities for constructional use.

Copper-Beryllium-Cobalt

The copper-beryllium-cobalt alloys are being developed under the name "Trodaloy No. 1." The cobalt addition reduces the beryllium solubility so that less of the latter is required for precipitation hardening. Good electrical conductivity and other desirable properties are secured but the field of use presumably will be very limited. The tensile strength ranges from 85,000 to 95,000 lb. per sq. in. as compared with 120,000 to 200,000 lb. per sq. in. for the 2.25 per cent beryllium-copper without cobalt.

Copper-Chromium Alloys

These alloys are used where high strength must be retained at fairly high temperatures, such as in welding machine parts. The alloys are amenable to heat treatment and when thus hardened may have an ultimate strength of 80,000 lb. per sq. in. with a conductivity of about 85 per cent. The alloys are hardened to 500 to 550 deg. C. and are fairly stable at temperatures somewhat below this range.

Alloys of Nickel

The role of nickel as a highstrength constructional metal was described in a paper by G. F. Geiger of the International Nickel Co. His discussion was devoted to the three principal high-nickel materials of construction, namely, pure nickel, Monel metal (a natural alloy of nickel and copper) and Inconel (an alloy of nickel and chromium).

Mr. Geiger pointed out that nickel was rolled as early as 1873 and produced as a commercial product about that time. Monel metal was introduced in 1905. Inconel is a relatively young alloy, since it was not introduced until 1931.

All three are white metals which do not readily tarnish in air at ordinary temperatures. They have high physical properties, particularly toughness, and excellent resistance to corrosion. Hot and cold working methods are used in production and fabrication and since these alloys are hardenable only by cold-working they may rapidly be cooled by quenching directly off the hot mills or from the annealing furnace.

Mr. Geiger pointed out that the coefficient of linear expansion of nickel is very close to that of mild steel, making possible a plymetal combination of nickel and steel called "nickel-clad steel." There is no warpage due to this bimetal combination. Commercial cladding runs from 10 to 20 per cent of nickel.

The strength and ductility of nickel, Monel metal and Inconel in some cases exceed equivalent properties of mild steel as well as the non-ferrous alloys — brass, bronze and nickel silver.

The tensile strength of annealed Inconel sheet and strip ranges up to 95,000 lb. per sq. in. Cold drawn wire averages 115,000 lb. per sq. in., and spring wire may have a strength of 220,000 lb. per sq. in.

The endurance limit (10° cycles) for annealed nickel, Monel metal and Inconel is 30,000, 35,000 and 32,500 lb. per sq. in. respectively. If these metals are cold-worked, the limits go up to 50,000, 55,000 and 44,000 lb. per sq. in. respectively.

Mr. Geiger stated that the high nickel content of these metals imparts good resistance to acids, alkalis and salts at room and moderately high temperatures. Numerous spring applications require such corrosion resistance as well as retention of physical properties at the higher temperatures. The choice of metal depends upon the service conditions or operating temperature. Inconel is now well established in the power field where it withstands superheated steam at 750 deg. F., with flashes up to 800 deg. F.

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Due to the high strength and ductility of these high nickel alloys they are extremely tough. The condition of the metal affects the impact values; hot-worked metal and metal with 5 to 15 per cent cold reduction have greater values than those in the annealed or hard-drawn condition.

Unannealed hot rolled nickel has an average Izod value of 100 ft. lb. Cold work reduces this value.

Unannealed hot-worked Monel metal has an Izod impact value of from 115 to 120 ft. lb. This is reduced with cold work. After 50 per cent cold reduction, the impact value still is high, being 65 to 80 ft. lb.

Impact tests on the Charpy testing machine have given values as high as 200 ft. lb. on unannealed Inconel. The specimen failed to fracture even at these high energy absorption values.

After describing other properties of these three metals, Mr. Geiger reviewed the working properties and fabricating procedures for each. This section of the paper was too expensive and elaborate to include in this abstract.

Carbon and Low-Alloy Steels

E. F. Cone, editor of *Metals and Alloys*, prepared a paper on carbon and low-alloy steels which are used for constructional purposes.

Mr. Cone pointed out that for structural purposes, particularly in the building of railroad cars, ships and other transportation equipment, plain carbon steels have for many years been the usual materials used. These steels average around 0.10 or 1.20 per cent C, 0.40 to 0.60 per cent Mn, and 0.10 to 0.20 per cent Si with a low sulphur and phosphorus content. The physical properties average 25,000 to 35,000 lb. per sq. in. yield strength; a tensile strength of 50,000 to 60,-000 lb. per sq. in.; and an elongation in 8 in. of 30 to 35 per cent in the "as-rolled" condition. The Izod impact value is around 40 ft.lb. and the endurance limit about 25,000 lb. per sq. in.

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ratio and a higher tensile strength so that structures of lighter weight with increased strength might be available, came the urge to develop a new steel. This urge was emphasized when "Cromansil" steel was announced. Mr. Cone stated that the fact that there were in existence certain established steels of this class seems to have been overlooked.

The name "Cromansil" was coined from the designations of the three main alloy constituents—Cr, Mn, Si. In general its composition is 0.40 to 0.60 per cent Cr, 1.00 to 1.40 Mn, and 0.60 to 0.90 Si.

No particular claims regarding non-corrosive qualities are made. From the study of a number of tests of samples exposed to the atmosphere, to sea water, to oil and gasoline in oil tankers, and to the action of mild chemicals in a plant, the loss by corrosion was somewhat less than the loss of plain carbon steels under the same conditions.

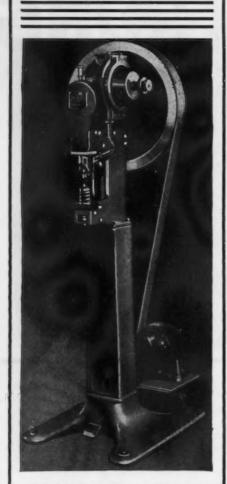
Mr. Cone next considered the more recently developed high elastic steels, that is, those primarily promoted by steel companies. They might very properly be classed as proprietary steels. All of these steels have been put on the market since the fall of 1934, with the exception of those of the United States Steel Corpn. A number of companies making these new steels and the names of the steels are as follows: United States Steel Corpn., Cor-Ten, Man-Ten and Sil-ten;

Republic Steel Corpn., RDS Grade 1, RDS Grade 1A; Alan Wood Steel Co., AW 70-90 Type A, AW 70-90; Central Iron & Steel Co., Centralloy Medium, Centralloy High; Youngstown Sheet & Tube Co., Yoloy; Granite City Steel Co., Granite City HS Grade 1, Granite City HS Grade 2; Jones & Laughlin Steel Corpn., Jalten; Continental Steel Corpn., Konik; Inland Steel Co., Inland Hi-Steel; American Rolling Mill Co., Armco HT-50; and others.

An outstanding characteristic of the numerous high elastic steels—some 17 in all—developed by the steel companies is that, for the most part, they may be regarded as improved copper-bearing steels. Copper in varying amounts is present in all of them, emphasizing the extent to which copper has come to be recognized as an effective alloying element.

In five of these so-called proprietary steels, and to a lesser degree in two others, nickel enters as an important factor. Molybdenum also comes into the picture in at least four types. In several of them the presence of chromium, as in CorTen, is considered essential. In others, vanadium is found.

An interesting and significant fact is the extent to which phosphorus as an alloy has come to be regarded. In four of these steels—Cor-Ten, AW 70-90, Inland Hi-Steel and Armco HT-50—the phosphorus content averages 0.10 to 0.20 per



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cent. The alloying possibilities of phosphorus are receiving greater attention and study as is evidenced by recent discussions in technical literature.

A high yield strength value, as already mentioned earlier in this paper, seems to be essential for various manifest reasons. All these special types of steels have an approximate yield point of 45,000 to 50,000 lb. per sq. in. or over. In some, the elastic ratio is quite high,

viz., Inland Hi-Steel and Armco HT-50.

In addition to their other benefits. briefly brought out in Mr. Cone's presentation, there is one advantage which these steels possess which, possibly, has not been fully considered. It has been pointed out to the author that, by their use, the range of stress within which undesirable concentrations of stress are avoided is considerably enlarged. It is well known that in the connection of members such local concentrations do occur, and that sometimes they are sufficiently great to cause plastic flow of the metal. While this flow relieves the stress in adjacent areas, there is reason to believe that it may lower the resistance of the part to fatigue at the points in question. The flow undoubtedly occurs in the vicinity of rivet holes or other discontinuities, and it is not entirely absent in welded joints. Since the range of the elastic behavior of the steels in question is higher than that of ordinary grades, it follows that, for a given unit stress, there will be a correspondingly wider uniform distribution of stress throughout the member before local plastic flow occurs. If accompanied by reasonably good ductility, this should result in raising the fatigue limit of members of high elastic steel, at least this is the view of some of the sponsors.

Mr. Cone submitted a word of caution with respect to those structures in which deformation (deflection) under load is strictly limited. Since the modulus of elasticity is approximately the same (29,000,000 lb. per sq. in.) for all grades of steel, it follows that, where a constant depth of member is used, there will be greater deformation under a high working stress than under a low one. If deformation is critical, however, its magnitude can be reduced by increasing the depth of the member. Of course, in many cases deformation is not a controlling factor.

Corrosion-Resisting Steels

The paper by E. E. Thum, editor of *Metal Progress*, was an elaborate treatise on the properties, uses and fabrication of heat and corrosion-resisting steels. The paper covered so much ground that only a sketchy summary is possible here.

Mr. Thum pointed out that despite moderate strength, 18 and 8 might be classed as an all-purpose alloy, being truly stainless in domestic uses, resisting seashore, industrial, and rural atmospheres completely, repelling drugs, food products, and most industrial chemicals better than the high chromium-iron alloys, and being

non-scaling in all furnace atmospheres (except those high in sulphur) to 1600 deg. Fahr. Its uses, therefore, are exceedingly numerous.

One source of serious trouble in the early history of the alloy is associated with the fact that its austenitic structure is metastable -that is, it exhibits a tendency to precipitate carbides if proper conditions are provided. It may be said that the iron-chromium-nickel solid solution can, in fact, hold a small amount of carbon in solution permanently. E. C. Bain and associates have determined this to be only 0.02 per cent carbon for 18 and 8, and say that "to stabilize austenite in a physico-chemical sense in a commercially low carbon 18 per cent chromium alloy at room temperature may require probably as much as 25 per cent nickel."

Consequently an 18 and 8 alloy containing more than 0.02 per cent carbon (and 0.05 to 0.07 per cent is about as low as practicable to manufacture, so that means all commercial 18 and 8's) will start to precipitate carbides from solid solution if held at temperatures between about 800 and 1600 deg. F. Theoretically the tendency to precipitate exists below 800 deg. F. but atomic mobility is so slight that formation and precipitation is practically frozen. Above 1600 deg. F., the upper limit, this low carbon alloy reenters the region where austenite is the true stable phase and any precipitated carbides are taken back into the solution. (These temperatures vary with the carbon, the range widening at both ends as carbon increases.) Practically the method of insuring a fully austenitic microstructure is to reheat a considerable time at 1800 to 2100 deg. F., long enough to redissolve carbides precipitated in its former stays at lower temperature, and cool as quickly as possible.

Mr. Thum also pointed out that excellent though the heat and corrosion resistance of the 18 and 8 alloys is, attempts have been made to improve it by further alloying. Many special compositions are now on the market for special purposes.

In the paper industry the equipment for cooking wood chips and handling sulphite liquors operates at temperatures up to 325 deg. F. and pressure of 80 lb. per sq. in. Failures of standard 18 an 8 alloys have caused the industry to specify 20 per cent chromium, 9 per cent nickel alloys for this purpose. Mills in the North Central States even favor 29 per cent chromium, 9 per cent nickel, while those on the West Coast like the 20-9 with 2 to 4 per cent molybdenum. Mills are steadi-



THE AMERICAN MONORAIL CO.

13103 Athens Ave., Cleveland, O.

ly moving toward complete alloy installations, not only to prevent iron coloration on the product but to prevent contact corrosion where alloy meets steel or non-ferrous alloys and for evaporators and concentrators.

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Complete stainless installations are particularly useful in the socalled indirect cooking method, wherein the hot acid is circulated through digester and external tubular heaters. Most damage to the corrosion resisting steels is done during shut-downs. The normal digester liquors at the end of the run may have no more than 0.25 per cent H2SO4, but the sulphite gradually oxidizes so that this figure increases in stagnant solutions. The stainless alloys become covered by an adherent and more or less protective deposit of calcium sulphate, but in a shutdown sulphuric corrosion may proceed rapidly under this scale. Other places where danger is met are at contact of stainless alloys with bronzes or copper and where litharge packing is used ... electrolysis is responsible here for extra SO, and rapid general corrosion. Localized stresses have also been the cause of serious corrosion.

Silicon increases the resistance of 18 and 8 to dilute hydrochloric acid at room temperature and to hot dilute sulphuric acids, but lowers the resistance to hot concentrated nitric acid. In general, silicon exerts but slight influence on corrosion resistance of 18 and 8 alloys and each proposed application should be based upon comparative tests under working conditions. However, silicon is undoubtedly useful to improve resistance to scaling. Representative tests show that 2 per cent silicon in a normal 18 and 8 reduces the scale losses 95 per cent (test period 36 hr. at 1800 deg. F.).

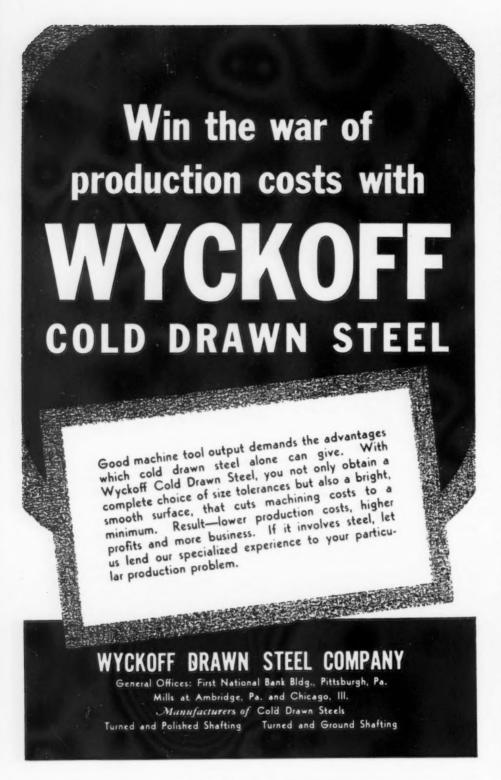
It is of no help in improving the toughness or creep stress at elevated temperatures, nor does it adversely affect the other mechanical properties of 18 and 8 even in sheet form when added in any quantity up to 5 per cent. Such high silicon will produce alpha-delta iron in the microstructure of the low carbon alloys, which strongly inhibits susceptibility to intergranular corrosion. Chromium - nickel - silicon

alloys of this type, even higher alloyed and stabilized with titanium, are probably the best that can now be furnished to the petroleum industry for certain new processes operating up to 1300 deg. F. and 3000 lb. per sq. in. pressure. The comparative utility of such materials in wrought, cast, and welded form is yet to be determined. Construction of the equipment is much hampered by lack of bolts to withstand such temperatures and not relax quickly under strain (creep) below 15,000 lb. per sq. in.

Tungsten up to 4 per cent has also been added to these high silicon steels to increase their creep resistance at high temperatures. Mr. Thum stated that data in his possession apply only to short time tensile tests, which, while they show very high values, may not be as convincing as the long time tests.

Molybdenum, from 2 to 4 per cent, is a more common addition. It has served well in the sulphite mills; it has solved many problems in the explosives and dye industry, and no less an authority than the late John A. Mathews said, "It en-

THE IRON AGE, March 12, 1936-87



hances general corrosion resistance against many chemicals and so far as I am aware never lowers it." Molybdenum also acts like silicon in inhibiting intercrystalline attack along welds when exposed to certain strong corrodents. Creep values also are raised considerably.

Mr. Thum closed his paper by considering the future of stainless steels. He stated that advances are so rapid that one cannot see very far, but there are indications of progress in several directions.

First will be changes leading to a reduction in price, the thing which so often turns the scale against stainless steel. Lowered prices will come through better steel making methods which will utilize raw material to better advantage and convert a larger percentage of the ingot into salable form. Developmental charges and special mill machinery will be written off, and the number of alloys

reduced and compositions standardized. Fabrication costs (a part of the total) will also be lowered by easier machining, less complex heat treating and welding, more rapid finishing, and a wider understanding on the part of capable shopmen.

The recent discovery of the combined action of nitrogen and carbon in the high chromium - iron alloys is of first importance. It leads one to hope that the chromium-irons can be usefully alloyed with boron (a nearby chemical element in the periodic table). The result should not be a mere substitute for something we now have, but another family of alloys of unique properties, perhaps of that desired family of stainless alloys, which may be worked and fabricated in the soft state, and then hardened and strengthened as a whole structure either by mere age or by a mild heating. The metallurgical theory for this process of precipitation hardening is well known and applied to many other alloys, some of them of excessive hardness and strength. By this means will eventually be found the alloys for high pressure containers (and bolts) to operate at temperature upwards of 1500 deg. F.

Indeed, we already have had one such high chromium alloy for a long time, but have not brought it under control. F. B. Foley recently published data on an old valve steel alloy containing about 10.5 per cent Cr, 0.50 per cent C, 1.5 per cent each of Ni and Al. Apparently the nickel and aluminum form an intermetallic compound which is fairly soluble in the austenite at 1600 deg. F., and can be kept in solution by air cooling. Reheating later at 1000 deg. F. precipitates a cloud of the NiAl particles through the metallic crystals and the alloy achieves a strength of 180,000 lb. per sq. in. with 20 per cent elongation.

Another thing we would like, and probably will get, is an 18 and 8 or equivalent austenitic alloy which will have a very high elastic limit and proof stress when severely cold worked for high ultimate strength. This will be hailed by chemical engineers, constantly on the search for metals with which to build process equipment for high temperature, high pressure reactions that have been proved in the laboratory stage, or for installations in other places where contamination of product is still a factor or where danger of breakdown is too great.

Finally Mr. Thum showed the desirability of an alloy which will not heat tint at oven temperatures. There would be a large demand for stainless steel baking dishes and roasting pans that stay bright.

Capital Goods Activity Revives Sharply

ELIEF from the encumbrances of ice and snow had a salutary effect upon business last week. THE IRON AGE index of capital goods activity rose sharply to 75.6 per cent of "normal" or base-period average. Two and three weeks ago respectively the index remained at a level of 70.9, indicating that the downward trend which began in January had been halted but that approximately a week was required for restorative forces to take effect. The figure of 75.6 contrasts with 59.6 for the comparable period last year and with 59.9 for the same week in 1934. In other words, business conditions in those industries which the index embraces is roughly 27 per cent better just at

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The Iron Age Weekly Index Numbers of Capital Goods Activity

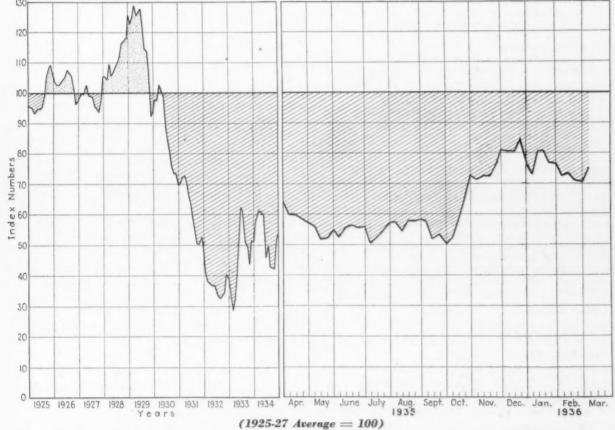
(1925-'27 = 100)

Last v	week .											75.6
Preced	ding v	week						*				70.9
Same												
Same	week	193	5.									59.6
Same												
Same												
Same	week	193	2.									38.7
Same	week	193	1									71.3
Same	week	193	0									95.8
Same												

present than was the case one and two years back.

Among the index's components gains were recorded by steel ingot output, automobile production, and lumber shipments. There was a further noticeable drop in heavy construction awards, but in the Pittsburgh district industrial production showed little change. Automobile output and lumber shipments both picked up strongly, the latter being stimulated by weather conditions, while motor car volume was favorably affected by increases in output of the three producers.

During February, THE IRON AGE monthly capital goods index, as calculated from the weekly figures, stood at 72.6.



THE Iron Age Index of Capital Goods Activity. The years 1925 to 1934 are plotted by months, by weeks since 1935.

Components of the index: Steel ingot production rate, from The Iron Age; revenue freight carloadings of forest products, from Association of American Railroads; automobile production from Cram's Automotive Reports; heavy construction contract awards. from Engineering News Record; index of productive activity in Pittsburgh district, from Bureau of Business Research of University of Pittsburgh.

Current Metal Working Activity Statistically Shown

These Data Are Assembled by The Iron Age from Recognized Sources and Are Changed Regularly as More Recent Figures Are Made Available.

Raw Materials:	January 1936	1935	January, 1935	Year 1934	Year 1935
Lake ore consumption (gross tons)*			2,280,393 2,889,552	22,113,951 31,821,576	30,861,473 35,209,240
Pig Iron:					
Pig iron output—monthly (gross tons)* Pig iron output—daily (gross tons)*			1,477,336 47,656	15,911,188 43,592	21,007,802 57,556
Castings:					
Malleable castings—production (net tons)		45,598	43,400	369,458	466,395
Malleable castings—orders (net tons) ^d		42,573	44,568	354,146	452,611
Steel castings—production (net tons) ^a		37,793 40,529	29,035 32,349	450,087 434,131	398,988 400,157
Steel Ingots:					
Steel ingot production—monthly (gross tons).	3,049,439	3,081,807	2,871,531	25,599,118	33,425.576
Steel ingot production—daily (gross tons)* Steel ingot production—per cent of capacity*	112,942 51.18	123,272 55.68	106,353 48.04	82,312 37.38	107,478 48,55
Employment in Steel Industry:					
Total employees*	*****		407,071	409,349	
Total payrolls (thousands of dollars)			\$44,329	\$457,848	
Average hours worked per week*			33.6	30.4	
Finished Steel:	3.366	3,025	2,333	49.110	42,229
Trackwork shipments (net tons)*	214,541	88,100	51,000	47,110	533,120
Steel rail orders (gross tons)*	174.805	203,318	321,831	1.830,682	2,473,489
Sheet steel production (net tons)	223.000	208,774	235,714	1,895,460	2,424,990
Fabricated shape orders (net tons)*	117,218	96,235	64,306	1,054,382	1,068,603
Fabricated shape shipments (net tons)*	73,710	76,214	89,627	1,116,222	1,095,216
Fabricated plate orders (net tons)	38,709	35,584	18,778	241,992	258,315
Reinforcing bar awards (net tons)*	67,810	29,025	17,750	182,351	318,340
U. S. Steel Corpn. shipments (tons)	721,414	661,515	534,055	5,925,873	7,371,299
Ohio River steel shipments (net tons)1	65,760	61,666	52,656	633,197	925,174
Fabricated Products: Automobile production, U. S. and Canada*	380,554	421,579	303,392	2,869,963	4,182.591
Construction contracts, 37 Eastern States	\$204 792 800	\$264 136 500		1,543,108,400 \$	
Steel barrel shipments (number) ⁴	*******	541,375	438,334	6,682,400	6,872,452
Steel furniture shipments (dollars) ^a		\$1,558,095	\$1,139,497	\$11,807,843	\$15,523,679
Steel boiler orders (sq. ft.)	623,426	684,735	391,784	4,368,563	6,245,158
Locomotive orders (number)	14	2	0	183	30
Freight car orders (number)	1,050	10,030	24	24,611	18,158
Machine tool index*	110.8	98.3	65.5	†46.2	†86.0
Foundry equipment index*	127.0	1.811	86.6	†60.5	†103.3
oreign Trade:		03.470	22 704	217.771	440.054
Total iron and steel imports (gross tons)		93,678 16,289	22,784 2,033	316,761 115,470	469,954 130,937
Imports of pig iron (gross tons)		21,812	15,054	113,354	216,567
Imports of all rolled steel (gross tons)* Total iron and steel exports (gross tons)*	241,564	239.269	262,740	2,832,764	3.067.336
Exports of all rolled steel (gross tons)	79,100	85,590	73.396	951,380	897.749
Exports of finished steel (gross tons)*	74.254	78,625	66,523	833,559	767.456
Exports of scrap (gross tons)	153,906	142,135	179,630	1,835,554	2,047,290
British Production:					
British pig iron production (gross tons)* British steel ingot production (gross tons)*	595,500 912,500	559,300 811,500	521,200 757,800	5,978,500 8,859,700	6,426,000 9,842,400
on-Ferrous Metals:					
Lead production (net tons)	36,296	42,020	29,314	412,298	421.764
Lead shipments (net tons)*	34,590	42,333	33,695	378,807	433,456
Zinc production (net tons)*	41,826	40,136	35,135	366,933	431,085
Zinc shipments (net tons)*	46,468	41,466	35,455	352,663	465,124
Deliveries of tin (gross tons)♥	6,635	5,360	4,600	46,215	59,110
tYearly average.					

†Yearly average.
Source of figures: *Lake Superior Iron Ore Association: bBureau of Mines; The Iron Age; bureau of the Census; American Iron and Steel Institute; National Association of Flat-Rolled Steel Manufacturers; American Institute of Steel Construction; United States Engineer, Pittsburgh; When preliminary, from Automobile Manufacturers Association—Final figures from Bureau of the Census; F. W. Dodge Corpn.; Railway Age; National Machine Tool Builders Association; Foundry Equipment Manufacturers Association; Department of Commerce: British Iron and Steel Federation; American Bureau of Metal Statistics; American Zinc Institute, Inc.; New York Commodities Exchange.

Announcement of Second Quarter Prices Promises Stability — Quantity Differentials Extended

Official Publication of Quotations on Sheets by a Leading Producer Is Believed an Important Innovation in Eliminating Selling Abuses — Production Rises for Sixth Consecutive Week

ANNOUNCEMENT of second quarter prices on all finished steel products, involving both increases and declines from recent quoted levels and inaugurating a quantity differential plan on sheets and strip steel, gives promise of early stabilization of currently irregular quotations.

Of even more importance was the official publication by a leading producer of price lists on sheets embodying the statement that "if and when any change is made in the price as announced, supplementary or revised announcement will be issued." This statement is believed to bind the company to adhere to open price practices and to make it liable under the Clayton act in the event of deviations.

IF other large companies also publish their prices with similar statements, the way would seem to be paved for price stability in the industry. This would be further enhanced by the application of quantity differentials on sheets, strip and hot and cold-rolled bars, the principal products used by the automotive industry, enabling large consumers to buy in quantities of 150 tons or more at prices \$3 a ton under the base quotations. The practice might later be extended to other finished steel products.

Reaffirmation of current official prices on the common finishes of sheets, strip steel and carbon bars, on which price concessions have recently been widespread, represents an actual increase in quotations. Reductions are recorded in enameling stock, while tin mill black plate and long ternes are unchanged.

Semi-finished steel is technically lower, although higher prices recently quoted have applied on little tonnage. Merchant wire products are largely reduced with nails off \$6 a ton, although manufacturers' wire is up \$2 to \$3 a ton. Revised discounts on standard pipe result in net prices averaging \$4 a ton below recent quoted levels. Quotations on rails and track accessories and tin plate are unchanged.

PLACING of heavier orders for March delivery in anticipation of steadier second quarter quotations is partly responsible for another rise in steel ingot production this week. The gain of one point is the sixth consecutive weekly increase and brings furnace operations to 57 per cent of capacity, the highest level since early last December.

S PRING weather has had an immediate effect upon the automobile industry and practically all producers have stepped up output. While March schedules are still difficult to determine accurately, Chevrolet alone plans to turn out 50,000 more units than it did in February, and corresponding increases may be expected elsewhere. Steel releases are expanding rapidly.

The advent of milder weather also is beginning to make itself felt in other lines, particularly on sales out of warehouse. Releases of construction steel are heavier and makers of road machinery are operating at capacity. These factors are reflected in THE IRON AGE index of capital goods activity, which rose sharply last week from 70.9 per cent of the base period to 75.6 per cent.

THE week's fabricated structural steel awards of 33,000 tons compare very favorably with last week's 14,000 tons, although a mill building at Ecorse, Mich., for the Great Lakes Steel Corpn. accounts for 16,000 tons of the current lettings. New projects call for 18,000 tons, compared with 11,350 tons in the preceding week.

While railroad purchases are being adversely affected by the uncertainty arising from labor controversy, decreased passenger fares and the extension of emergency freight rates, important orders are still being placed. The Chesapeake & Ohio has bought 20,000 tons of rails and the Kansas, Oklahoma & Gulf, 5700 tons. Early placing of the steel for 3000 cars for the Pacific Fruit Express is looked for, and the Chesapeake & Ohio may soon enter the market for several thousand freight cars.

SCRAP prices are holding their own in practically all districts, but only minor advances are now being reported. In the next week or two it will be determined whether or not the sharp advances of the last two months can be maintained in the face of a steadier flow of materials. The Iron Age composite scrap price is holding at \$14.75 a gross ton for the third week.

Pig iron buying has been adversely influenced by uncertainty regarding second quarter steel prices, but sizable orders are now being placed at the official market quotations. The Iron Age composite pig iron price is unchanged at \$18.84 a gross ton, but the finished steel composite is down to 2.084c. a lb., as the result of lower pipe prices.

A Comparison of Prices

Market Prices at Date, and One Week, One Month, and One Year Previous; Advances Over Past Week in Heavy Type, Declines in Italics

Pig Iron					Finished Steel	Mar. 10, 1936	Mar. 3,	Feb. 11, 1936	Mar. 12, 1935
Per Gross Ton:	1ar. 10, 1936	Mar. 3, F 1936	reb. 11, A 1936	Mar. 12, 1935	Per Lb.:	Cents	Cents	Cents	Cents
No. 2 fdy., Philadelphia	\$21.3132				Hot-rolled annealed sheets, No. 24, Pittsburgh		2.40	2,40	2,40
No. 2 Southern, Cin'ti					Hot-rolled annealed sheets,				
No. 2, Birmingham†		15.50	15.50	14.50	No. 24, Gary	2.50	2.50	2.50	2.50
No. 2 foundry, Chicago*		19.50	19.50	18.50	Sheets, galv., No. 24, P'gh		3.10	3.10	3.10
Basic, del'd eastern Pa					Sheets, galv., No. 24, Gary	3.20	3.20	3.20	3.20
Basic, Valley furnace		19.00	19.00	18.00	Hot-rolled sheets, No. 10, P'gh		1.85	1.85	1.85
Malleable, Chicago*		19.50	19.50	18.50	Hot-rolled sheets, No. 10, Gary		1.95	1.95	1.95
Malleable, Valley		19.50	19.50	18.50	Wire nails, Pittsburgh	2.10	2.10	2.40	2.60
L. S. charcoal, Chicago					Wire nails, Chicago dist. mill.	2.15	2.15	2.45	2.65
Ferromanganese, seab'd car-	20.2020	2012020	-012020	21101	Plain wire, Pittsburgh		2.30	2.30	2.30
lots	75.00	75.00	75.00	85.00	Plain wire, Chicago dist. mill.		2.35	2.35	2.35
Amile enstation is the Avilian	1 0			h	Barbed wire, galv., P'gh		2.50	2.80	3.00
†This quotation is for deliver are 38c. a ton under delivered qu					Barbed wire, galv., Chicago		0.55	9 0 5	2.05
furnace.					dist. mill		2.55	2.85	3.05
*The switching charge for decago district is 60c. per ton.	elivery 1	to found	ries in 1	the Chi-	Tin plate, 100 lb. box, P'gh	\$0.20	\$5.25	\$5.25	\$5.25
					Scrap				
Rails, Billets, etc.					Per Gross Ton:				
					Heavy melting steel, P'gh	\$15.75	\$15.75	\$14.75	\$12.25
Per Gross Ton:					Heavy melting steel, Phila	*	13.75	12.75	10.50
Rails, heavy, at mill					Heavy melting steel, Ch'go		14.75	13.75	10.75
Light rails, Pittsburgh		35.00	35.00	35.00	Carwheels, Chicago		14.00	13.50	11.00
Rerolling billets, Pittsbugh		29.00	29.00	27.00	Carwheels, Philadelphia		14.75	14.75	12.50
Sheet bars, Pittsburgh		30.00	30.00	28.00	No. 1 cast, Pittsburgh		14.25	14.25	12.75
Slabs, Pittsburgh		29.00	29.00	27.00	No. 1 cast, Philadelphia		14.25	13.00	11.00
Forging billets, Pittsburgh		35.00	35.00	32.00	No. 1 cast, Ch'go (net ton)		13.50	12.50	9.50
Wire rods, Nos. 4 and 5, P'gh		40.00	40,00	38.00	No. 1 RR. wrot., Phila		13.25	13.25	11.00
Chalm grand stool Digh th	Cents	Cents	Cents	Cents	No. 1 RR. wrot., Ch'go (net)		13.25	12.50	8.50
Skelp, grvd. steel, P'gh, lb	1.80	1.80	1.80	1.70					
Finished Charl					Coke, Connellsville				
Finished Steel					Per Net Ton at Oven:				
Per Lb.:	Cents	Cents	Cents	Cents	Furnace coke, prompt	\$3.65	\$3.65	\$3.65	\$3.85
Bars, Pittsburgh	1.85	1.85	1.85	1.80	Foundry coke, prompt	4.25	4.25	4.25	4.60
Bars, Chicago	1.90	1.90	1.90	1.85					
Bars, Cleveland	1.90	1.90	1.90	1.85	Matala				
Bars, New York	2.20	2.20	2.20	2.13	Metals				
Plates, Pittsburgh	1.80	1.80	1.80	1.80	Per Lb. to Large Buyers:	Cents	Cents	Cents	Cents
Plates, Chicago	1.85	1.85	1.85	1.85	Electrolytic copper, Conn	9.25	9.25	9.25	8.75
Plates, New York	2.09	2.09	2.09	2.08	Lake copper, New York	9.37 1/2	9.37 1/2	9.37 1/2	9.124
Structural shapes, Pittsburgh	1.80	1.80	1.80	1.80	Tin (Straits), New York		48.00	48.121/2	46.80
Structural shapes, Chicago	1.85	1.85	1.85	1.85	Zinc, East St. Louis		4.90	4.85	3.90
Structural shapes, New York.	2.06 1/4	2.06 14	2.06 1/4	2.05 %	Zinc, New York			5.22 1/2	4.25
Cold-finished bars, Pittsburgh	2.10	2.10	2.10	2.10	Lead, St. Louis		4.45	4.35	3,40
Hot-rolled strips, Pittsburgh.	1.85	1.85	1.85	1.85	Lead, New York		4.60	4.50	3.55
					Antimony (Asiatic), N. Y		13.25		14.50

The Iron Age Composite Prices

	Finished Steel	Pig Iron	Steel Scrap			
March 10, 1936 One week ago One month ago One year ago	2.084c. a Lb. 2.109c. 2.109c. 2.124c.	\$18.84 a Gross Ton 18.84 18.84 17.90	\$14.75 a Gross Ton 14.75 13.75 11.17			
	Based on steel bars, beams, tank plates, wire, rails, black pipe, sheets and hot-rolled strips. These products represent 85 per cent of the United States output.	Based on average of basic iron at Valley furnace and foundry irons at Chicago, Philadelphia, Buffalo, Valley and Birmingham.	Based on No. 1 heavy melting steel quotations at Pittsburgh, Philadelphia and Chicago.			
1936	HIGH Low 2.130c., Jan. 7; 2.084c., Mar. 10 2.130c., Oct. 1; 2.124c., Jan. 8 2.199c., April 24; 2.008c., Jan. 2 2.015c., Oct. 3; 1.867c., April 18 1.977c., Oct. 4; 1.926c., Feb. 2 2.037c., Jan. 13; 1.945c., Dec. 29 2.273c., Jan. 7; 2.018c., Dec. 9 2.317c., April 2; 2.273c., Oct. 29 2.238c., Dec. 11; 2.217c., July 17 2.402c., Jan. 4; 2.212c., Nov. 1	High Low \$18.84, Jan. 7; \$18.84, Jan. 7 18.84, Nov. 5; 17.83, May 14 17.90, May 1; 16.90, Jan. 27 16.90, Dec. 5; 13.56, Jan. 3 14.81, Jan. 5; 13.56, Dec. 6 15.90, Jan. 6; 14.79, Dec. 15 18.21, Jan. 7; 15.90, Dec. 16 18.71, May 14; 18.21, Dec. 17 18.59, Nov. 27; 17.04, July 24 19.71, Jan. 4; 17.54, Nov. 1	HIGH Low \$14.75, Feb. 25; \$13.33, Jan. 7 13.42, Dec. 10; 10.33, April 23 13.00, Mar. 13; 9.50, Sept. 25 12.25, Aug. 8; 6.75, Jan. 3 8.50, Jan. 12; 6.43, July 5 11.33, Jan. 6; 8.50, Dec. 29 15.00, Feb. 18; 11.25, Dec. 9 17.58, Jan. 29; 14.08, Dec. 3 16.50, Dec. 31; 13.08, July 2 15.25, Jan. 11; 13.08, Nov. 22			

Price Clarification Aids Pittsburgh Steel Demand



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ents

2.40

2.50 3.10 3.20

1.85 1.95 2.60

2.30 2.35

3.00

3.05 5.25

2.25 0.50 0.75

1.00

2.50

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Ingot Output Unchanged as Production in Valleys Reaches Highest

Level in Five Years

Pittsburgh, March 10.—Announcement of new prices on semi-finished steel, wire and tubular products and reaffirmation of other quotations points toward a definite move for stabilization of the steel price structure. An important change also affects hotrolled bars, sheets and strip, which, in quantities of 150 tons or more, will earn a \$3 a ton reduction whereas formerly the largest deduction allowable on bars only was \$2 on purchases of 100 tons or more.

In cases where price changes represent reductions, the new quotations are effective immediately. In the case of some grades of wire which have been increased \$2 to \$4 a ton, consumers will be protected at present price until March 31.

While it is too early to discern the effect of price changes on finished steel demand, some mills are counting on a fair anticipatory buying movement in cases where prices will be increased for second quarter, with automotive demand picking up here and there, the new result of price revisions is not expected seriously to affect the aggregate movement of steel for the next month or two. Seasonal activity in building lines, the automotive industry and rolling equipment for railroads is expected to increase mill activity in this district in the near future. Meanwhile ingot production in the Pittsburgh district is steady at 39 per cent of capacity. In the Valleys and nearby northern Ohio, mill production has been stepped up three points to 68 per cent, the highest level reached in about five years. Production in the Wheeling district is unchanged at 80 per cent of capacity. Strip production has jumped 12 points to about 50 per cent of capacity, while sheet output is unchanged at 65 per cent. Tin plate is slightly lower at 75 per cent.

Pig Iron

Current quotations have been reaffirmed for second quarter delivery. Inquiries for that period have been scarce, and producers here are occupied largely with shipping spot lots. The aggregate movement of pig iron since March 1 is running slightly ahead of that in the like period in February, indicating that stocks accumulated late in fourth quarter are being thinned out.

Semi-Finished Steel

Leading producers have announced a price of \$28 a ton, Pittsburgh, on billets, slabs and sheet bars for second quarter delivery. The price of \$35 a ton on forging billets has been reaffirmed, as has the 1.80c., Pittsburgh, figure on skelp. Wire rods are quoted at a range of \$38 to \$42 a ton, depending on size. Meanwhile, ship-ments of semi-finished steel in the Meanwhile, past fortnight have tended upward, strongly suggesting that there is an anticipatory movement under way in advance of the expected firming in prices. Shipments of sheet bars to non-integrated sheet tin plate mills have been little affected one way or another by the price situation, and are moving steadily into consumption in substantial volume.

Bars

The current 1.85c., Pittsburgh, price on carbon bars has been reaffirmed for second quarter, but quantity differentials have been revised to permit deductions of \$3 a ton on shipments of 150 tons or more to one destination at one time. An improved demand from automotive sources, while not marked, brought a note of encouragement to producers here who are banking heavily on such business for early second quarter schedules. Miscellaneous bookings are steady.

Bolts, Nuts and Rivets

Specifications against first quarter contracts are holding up in good volume, with further increases noticeable in requirements for railroad car builders. Demand from

the automotive industry is a little more vigorous, but is not measuring up to the pace set late in fourth quarter.

Reinforcing Steel

The recently established schedule for shipping direct to jobbers' customers has not been in force long enough to have met a crucial test, but producers in this district are intent upon adhering to the set-up. Although prices have not been formally announced for second quarter, any business for that period would be acceptable at current published quotations. nage booked in the past week reflected a sharp increase over business in recent weeks. Part of this improvement is believed attributable to more open weather and to a growing expectation of wider price stability for the coming quarter.

Cold-Finished Bars

Improved demand has appeared during the past week, with specifications from automotive interests showing signs of loosening up. A steady volume of miscellaneous business continues to be a bright spot in this market. As yet second quarter prices have not been formally announced. However, first quarter quotations will probably be reaffirmed.

Sheet Steel Piling

Second quarter prices have not been reaffirmed at this writing. It appears unlikely, however, that any change from the present base of 2.15c., Pittsburgh, will be made.

Plates and Shapes

Some railroad car builders are ordering plates rather meagerly, since the carriers are not anxious, in some instances, to have new rolling equipment delivered before spring gets well under way. The Standard Oil Co. of New Jersey has ordered four all-welded steel tank barges, calling for about 800 tons of plates and small shapes, from Marietta Mfg. Co.

Contract for about 16,000 tons of structural steel for the Great Lakes Steel Corpn. plant addition at Ecorse, Mich., has formally been placed with Whitehead & Kales, Inc. This order is the largest for private work reported here this year. Other recent contracts entailed largely State highway bridge construction. New inquiries are featured by an Aluminum Co. of America building at New Kensington, Pa., calling for 1000 tons.

Plate and shape prices for second quarter have been reaffirmed at 1.80c., Pittsburgh.

Hy-Ten "A" Temper No. 1X Analysis

.20 CARBON-MN-MO ALLOY STEEL

A free machining carburizing steel of controlled grain size suitable for gears, worms, clutches, chuck jaws, cams, forming rolls, spindles, etc., which responds with excellent results to single or double treatment.

IN STOCK FOR IMMEDIATE DELIVERY

WHEELOCK, LOVEJOY & COMPANY, INC.

CAMBRIDGE

CLEVELAND

CHICAGO

NEWARK

DETROIT

Tubular Products

Announcement of second quarter prices reveals approximately a 5 per cent reduction in butt-weld pipe, with lap-weld quotable at lesser amounts. The price changes in reality constitute a leveling down to quotations that had been previously in effect. No change in oil-country goods has been effected for second quarter. On the new discount card, trimmings to consumers are absorbed.

Wire Products

Prices on wire products have been formally announced for sec-ond quarter. The base price for standard and smooth coated wire nails is \$2.10 per keg, with jobbers receiving a 10c. discount instead of 20c. Annealed fence wire will be quotable at \$2.65, and galvanized wire at \$3.00, base per 100 lb., reflecting increases of \$4 a ton. Galvanized barbed wire is priced at \$2.60, a \$4 a ton decrease, while polished staples at \$2.80 and galvanized staples at \$3.05 reflected a \$6 a ton reduction. Woven wire fence has been decreased \$3 a net ton. Bright wire to the manufacturing trade is \$2 a ton higher at

\$2.40. Where reductions are effected, the changes will apply immediately, but in cases where advances have been announced customers are protected at present prices through first quarter.

Sheets

A leading producer of sheets has reaffirmed present asking prices on all grades except enameling stock, which is \$3 a ton lower, and inaugurated quantity differentials on second quarter deliveries. The differentials, however, apply only to hot and cold-rolled sheets and long teines. Under the new set-up, quantities of one to 25 tons of one grade and gage for shipment to one place at one time take the base price, while deductions of \$1 to \$3 a ton are provided for on larger Details are available quantities. on page 113.

Tin Plate

The moderating of schedules by a leading producer will force a slight average reduction in output this week to about 75 per cent of capacity. A large part of the present rolling is in anticipation of early spring crops, and, while some

old plate in mill hands has moved recently, the net result has been a slight increase in consumers' stocks still in mill warehouses. Some relief is in prospect when calls for seasonal pack this spring become more urgent. Tin mill black plate, while not officially reaffirmed for second quarter, is being sold in some directions for that period at an unchanged Pittsburgh base of 2.75c. a lb.

Strip Steel

A sharp improvement in demand during the past week provided an impetus for an increase of about 12 points in hot-rolled production to about 50 per cent of capacity. The most noticeable improvement was discernible in calls from stamping and other automobile interests. Hot and cold-rolled strip prices of 1.85c. and 2.60c., Pittsburgh, have been reaffirmed for second quarter, but are subject to quantity differentials as described in detail on page 113.

Coal and Coke

Continued mild weather has exerted a further depressing influence on the domestic coal and

Weekly Indications of Steel Activity

	From T	HE IRON A	GE			to Date
M	ar. 10, 1936	Mar. 3, 1936	Feb. 11, 1936	Mar. 12, 1935	1936	1935
Steel ingot operations—Per cent of capacity	57.0	56.0	53.0	47.5	52.7	50.0
		Wee	k Ended		Year	r to Date
Ma	ar. 10, 1936	Mar. 3, 1936	Feb. 11, 1936	Mar. 12, 1935	1936	1935
Fabricated structural steel awards	33,000	14,000	19,650	6,450	222,785	130,355
Fabricated plate awards	8,720	2,215	7,835	1,325	74,387	49,090
Sheet steel piling awards	0	0	2,760	0	14,045	4,300
Reinforcing bar awards		4,350	3,260	2,250	105,005	58,640

coke market. Prices for domestic sizes continue to be weak, with some quotations 30 to 60c. a ton lower in the past fortnight. Industrial fuel, however, seems to be resisting the weakness in other grades, although demand is far from robust. As a consequence of the uncommonly heavy call for screened sizes during the winter months, slack is very plentiful and will be under some pressure for a market until the seasonal movement to the Lakes and for cement manufacture begins.

Scrap

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Shipments are moving a little more freely to one or two plants in this district, but the aggregate movement of scrap from producing sources into this area still is sufficiently meager to support current quotations. Brokers who are short have lowered their bidding prices for No. 1 steel to below \$15. Small yard dealers, however, evidently have not yet found that figure tempting. Cast scrap has firmed perceptibly. A tonnage of heavy breakable cast has been sold at \$13.50, delivered, representing a 50c advance over the last representative sale. No. 1 cast has been sold to two mills at \$15.50, or \$1 a ton above the previous market.

Detroit Scrap Prices Easier This Week

DETROIT, March 10. — An easier situation is apparent in the Detroit scrap market. Owing to milder weather, much frozen scrap is coming out of the yards and supply has caught up with demand for first time in weeks. The recent rise in automotive production should boost steel mill operation so as to maintain the scrap market at levels only slightly below recent highs.

Steel Corporation Shipments Lower

CHIPMENTS of finished steel products by the United States Steel Corpn. totaled 676,315 tons in February, as against 721,414 tons in the preceding month and 583,137 tons a year ago. Although the February tonnage represents a decline from January, it was sufficient to raise the corporation's daily operating rate slightly.

As measured by shipments, the corporation's finished steel-making facilities were engaged during the month at 43.7 per cent of capacity. In January the rate was 43.1 per cent, and a year ago it was 39.2 per cent.

PAINT and LACQUER

DARTLETT-SNOW drum painting, drying, and conveying equipment is widely used in manufacturing and reconditioning plants.

Drums are received from the paint boothplaced on cradles—carried through the drying and cooling zones with only point contact on the chime-upended and carried to the shipping or storage rooms in continuous automatic fashion.

Paint ovens and high temperature ovens for lacquer, paint machines, paint booths, drum washers, dedenters, upenders and conveyors are included in the complete line. Complete or partial installations. Original equipment or replacement. Descriptive literature sent on request.

THE C. O. BARTLETT & SNOW CO. 6202 Harvard Avenue In New York-Cleveland, Ohio

30 Church St.

In Chicago -First National Bank Bldg. Conveyors

Elevators

Drum Painting and Handling Equipment

Dryers

Complete Coal and Ash Handling Systems for Boiler Plants

Chains, Sprockets. **Buckets**

Dust Collectors

Skip Hoists

Foundry Sand Handling Equipment

int Booths and Ovens

WASHERS-DEDENTERS-TES CONVEYORS-PAINT MACHINES-UP-ENDERS

MONTHLY SHIPMENTS OF STEEL PRODUCTS BY UNITED STATES STEEL CORPN.

			1934	-	193	5	1936		
		Per Cent		Per		Per Cent	,	Per Cent	
	Ship-	of Ca-	Ship-	of Ca-	Ship-	of Ca-	Ship-	of Ca-	
Month	ments	pacity	ments	pacity	ments	pacity	ments	pacity	
January	285,137	17.7	331,777	19.8	534,055	31.9	721,414	43.1	
February	275,929	18.5	385,500	25.9	583,137	39.2	676,315	43.7	
March	256,793	15.3	588,209	35.2	668,056	41.5			
April	335,321	21.6	643,009	41.5	591,728	36.7			
May	455,302	27.1	745,063	44.5	598,915	35.8			
June	603,937	37.4	985,337	61.2	578,108	36.7			
July	701,322	45.1	369,938	23.9	547,794	34.0			
August	668,155	39.8	378,023	22.6	624,497	37.3			
September	575,161	35.6	370,306	23.9	614,933	39.7		***	
October	572,897	35.5	343,962	20.6	686,741	41.1			
November	430,358	26.7	366,119	22.7	681,820	42.3			
December	600,639	38.7	418,630	27.0	661,515	42.7		***	
D1 .	_	-	-	-	-		-	-	
Plus or minus year- ly adjustment	(44,283)	* * *	(19,907)	***	* * * * * *	* * *	*****		
Total for year	5,805,235	30.1	5,905,966	30.6	7.371.299	38.3			

Steel Orders Heavier In Chicago District



Ingot Output Unchanged—Second Quarter Prices Announced on All Products—Scrap Remains Firm

HICAGO, March 10.—New orders are the second best of the year in volume, but they are not yet reflected in specifications and ingot production remains stationary at 63 per cent of capacity. It has been only in recent days that buyers have shown a real urge to take advantage of low prices, but with second quarter books just opened on all products and a third of March past, there is now little opportunity for consumers to gain in a large way by the situation.

Stabilization of reinforcing bar quotations in the Chicago area is meeting with a good measure of success. Wire producers are announcing new schedules that are in general above the lows reached at the peak of price confusion. Sheet and strip makers did not open books for the second quarter until today with important changes in extras. Plate, shape and bar prices, which have not suffered materially in the general mix-up, are steady and producers are opening books at current quotations.

From the viewpoint of production the most encouraging news of the week is that automobile plants are resuming operations on a broader scale and they are not only making new commitments, but are drawing more heavily against mill shipments.

To those who watch scrap as a key to nearby developments it can be pointed out that prices remain strong and there is no oversupply in sight.

Pig Iron

Second quarter books have been opened about a week and some attractive tonnages have been taken. However, melters are not slow to get a picture of the recent steel price demoralization and they have been inclined to use it as a lever against pig iron prices. So far, their arguments have been of no avail. Chicago foundries are be-

ginning to feel the impulse of improved automobile building.

Cast Iron Pipe

Better weather and the clearance of many roads of ice and snow is permitting distribution of cast iron pipe and releases are reaching foundries in far more satisfactory volume. New purchases remain scattered and small, individual orders seldom being for more than two cars. Private requirements remain in hiding and practically all current business can be filed under alphabetical designations of the Government. There is no disturbance of cast iron pipe prices.

Reinforcing Bars

Sewer and sanitary work in and near Chicago is bringing attractive tonnages to shops and now, with better weather at hand, road slab and bridge work is coming to life. There is a fair amount of private work but it must be counted in numbers of projects rather than in tonnage. All old quotations were withdrawn as of March 2 and prices submitted since that date show that the new levels of 2.10c. for billet bars and 1.95c. a lb. for rail steel reinforcing bars are stable in the Chicago area. However, weakness still prevails at St. Louis and as far north as Peoria, Ill.

Wire Products

Books for second quarter are being opened and all prices are being changed. Quotations to the manufacturing trade are being advanced 10c. to 15c. a 100 lb. Wire nails are pegged at \$2.10 a keg, fence wire is being marked up and prices for woven wire fence and bale ties are being dropped \$3 and \$2 a base column, respectively. General sales show some improvement, but undoubtedly price confusion that is now being cleared has held buyers in check. The TVA decision was unfavorable to utility activity but it is expected that heavier requirements will be

forthcoming from this source during the summer months. Demand for wire rope is broadening and it should grow as the weather improves and favors out-of-door construction. The Administration's proposed taxes on industry are being counted on to spur capital expenditures that will react materially to the benefit of all steel producers.

Sheets

New purchases are mounting as users try to get under the line before second quarter prices are in effect, for it is announced that the low prices now obtainable will be withdrawn. Specifications enlivened by automobile manufacturers' needs, are bounding upward, and deliveries have been pushed back to 30 days on the average.

Plates

Water tanks and a pipe line, awarded on the Pacific Coast, account for 2500 tons of plate business. In the Chicago market tonnage of this character is scarce and mills are being forced to fall back on spotty miscellaneous demand and such materials as go to car shops, both private and railroad. About 1300 tons of material has been ordered out for the Santa Fe cars and hardly a day passes that some railroad shop does not come in for repair materials. specifications are now out on the 3000 cars for the Pacific Fruit Express and placement of this business is an early possibility.

Rails

The Kansas, Oklahoma & Gulf has ordered 5700 tons from Carnegie-Illinois Steel Corpn. Tonnages in prospect are 28,000 tons from the Rock Island and 5400 tons from the Chicago & Eastern Illinois. Accessories are moving slowly, but the time is at hand when larger quantities will be needed for spring track improvement programs. The light rail market is better than it has been for several years.

Structural Material

Recently awarded tonnages are now reaching mills who report that both sales and specifications are heavier. New awards are topped by a 2250-ton court house at Nashville, Tenn. Fresh inquiries are not important as to individual size, though the aggregate is about 4300 tons, made up for the most part of bridge work in Minnesota, Wisconsin, Iowa, Illinois and Indiana.

Bars

Demand is surging forward in

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automobile centers and at the many locations of parts makers. Forging plants are busier and there is no let-up in the pressure that farm implement manufacturers are exerting for steel deliveries. Road machinery builders have reached an active late winter stride and they will gain momentum as time passes.

practically all directions including

Favorable weather is resulting in some congestion at mills, but this cannot be taken as an indication that supplies are bountiful. situation is a temporary one which resulted from the damming of shipments by snow and zero weather. The pressure under which brokers are laboring to meet mill requirements is shown by the movement of some second grade material which is promptly being rejected by mills. Railroad scrap, which before the hard winter came out very promptly, is slow in reaching destination. The average time being well over 60 days. Price structures remain strong and sellers count on greater activity at mills to add more strength to the market.

Reinforcing Steel

Awards 14,615 Tons-New Projects 7470 Tons

AWARDS

Boston, 150 tons, Lucy Stone school addition, to Concrete Steel Co.

Meadville, Pa., 625 tons, Viscose Co., to Concrete Steel Co.

New York, 170 tons, Boynton Realty Co. building, to Concrete Steel Co.

State of New Jersey, 100 tons, procurement division of the Treasury Department, to Julius Orhlin and Egleston Bros. & Co.

Oak Park, Ill., 200 tons, sewer, to an unnamed bidder.

Freeport, Ill., 150 tons, Kraft-Phoenix Cheese Co., to an unnamed bidder.

State of Illinois, 200 tons, paving and bridge work, to Calumet Steel Co.

Chicago, 650 tons, South West project to 5 for Sanitary District, to Concrete No. 5 fo Steel Co.

Chicago, 125 tons, public school buildings, to unnamed bidders.

Chicago, 100 tons, Humboldt Park housing project, to Calumet Steel Co.

Cicero, Ill., 1050 tons, Sanitary District project, to an unnamed bidder.

University City, Mo., 200 tons, senior gh school auditorium, to Laclede Steel

University City, 155 tons, junior high school, to Missouri Rolling Mills Corpn.

West Milwaukee, Wis., 120 tons, high school addition, to Bethlehem Steel Corpn.

The Good Red Metal

Forty-five centuries before Calvary, Chaldeans beat native copper into usable shapes, used them for cooking. Later they hardened it with tin and, from then on, bronzeconscious peoples excelled in war because their spear-heads didn't bend!

Sixty-three centuries later, Paul Revere rolled out the first Ameri-



"like tooth paste from a tube"

can copper sheets-roofed the State House dome, helped build Robert Fulton's boilers, supplied the copper sheath for the frigate "Constitution."

Today - A. D. 1936 - modern man manipulates the good red metal and its alloys in mammoth plants. He casts it, rolls it, machines it, draws it, extrudes it, spins it.

Molten metal flows from furnaces to molds and, cooled, the cast billets are stripped from the molds by powerful plungers.

Near by, the restless air giant drives a billet into its containerheavy dies are moved into placebillet containers are held against the dies by air pressure-all the intricate auxiliary operations of the mammoth machine are air-actuated. a necessary and rhythmic prelude to the final dramatic action when hydraulic power forces the metal through the die and cherry-red shapes of accurate dimension and great beauty emerge, like tooth paste from a tube. That's extrusion.

Bars of brass pass through milling machines and air-operated steel fingers flip and turn them for inspection. Air strips sheets of metal from rolling mill blockers and at the stitchers their ends are air-

At the "bull block," air strips the shining wire from the drum. At every point where there's a job for air to do-to exert pressure, to actuate heavy machines, to hold work in place-air confined in cylinders is controlled by tight, positive, quick-acting valves-Ross Operating Valves-operated by hand, foot or solenoid.



"or solenoid"

If in your bosiness you have aircontrolled operations, you ought to know about the Ross Operating Valves - "The Bridles for Air Horsepower." Will you let us tell you? Write Ross Operating Valve Co., 6488 Epworth Blvd., Detroit, Michigan.

Fort Peck, Mont., 9500 tons, tunnels, to Sheffield Steel Corpn.

Sacramento, Cal., 471 tons, foundations r Motor Vehicle building, to Concrete Engineering Co.

Taft, Cal., 250 tons, alterations on Taft high school, to an unnamed bidder.

Seattle, 200 tons, bridges on West Dravis and McGraw Streets, to unnamed bidders.

Seattle, 200 tons, bridges on Second Avenue, West and Queen Ann, to North-west Steel Rolling Mills.

NEW REINFORCING BAR PROJECTS

State of New Jersey, 435 tons, highway bridge; new bids being taken.

Union City and Jersey City, 200 tons, stadium; new bids being taken.

Albany, N. Y., 600 tons, Montgomery Ward building.

Chicago, 400 tons, intercepting sewer No. 1; Mike Pontrelly low bidder on general contract.

Chicago, 200 tons, Outer Drive and bridge; Great Lakes Dredge & Dock Co. low bidder.

Springfield, Ill., 150 tons, archives build-

Peoria, Ill., 200 tons, high school.

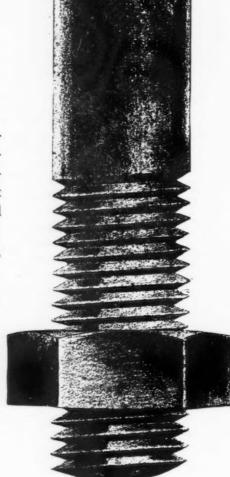
THE IRON AGE, March 12, 1936-97

FOR ANY JOB

Eighty-two years of performance, service, dependability, and experience back of every Clark Bolt, Nut, Screw, and Rivet.

Standards and Special.

Write for latest catalog.



Clark St., MILLDALE, CONN.

Springfield, Ill., 237 tons, armory; United States Fire Proofing Co. general contrac-

Milwaukee, 500 tons, elevator for Foredtert Grain & Malting Co.; bids about April 1.

Phoenix, Ariz., 2750 tons, Bartlett dam on Salt River Valley project; bids April 7.

Austin, Tex., 250 or 1900 tons, Arnold dam and power plant on Colorado River project; bids March 31.

Long Beach, Cal., 800 tons, plant for pencer Kellogg Co.; general contract

Pipe Lines

Service Gas Co., Coudersport, Pa., recently organized as a subsidiary of Godfrey L. Cabot, Inc., 77 Franklin Street, Boston, Thomas Cabot, treasurer, plans new 4-in. welded steel pipe line in Ellisburg, Pa., oil field district, near Braddock, to connect with present 6-in. line for natural gas transmission. Company also plans other welded steel pipe lines for similar service for consumers in Potter, Tioga and McKean counties, Pa., for which application for permission has been asked. Cost over \$200,000.

R. G. Frye, Gillette, Wyo., is at head of project to build welded steel pipe line from natural gas fields in State to city limits and installation of pipe line dis-

tribution system. Council has granted a 50-year franchise to supply municipality with natural gas, with provision that installation is completed by Nov. 1, 1936. Cost over \$100,000.

Phillips Petroleum Co., Bartlesville, Okla., has plans for new 24-in. welded steel pipe line in Thirtieth Street, Oklahoma City, about 7300 ft., for natural gas transmission. A. H. Riney, Bartlesville, is company engineer.

company engineer.

Ford Motor Co., Dearborn, Mich., plans extensions in steel pipe line system for industrial gas supply to different departments at River Rouge plant, including about 600 ft. of 60-in. for main service, and several thousand feet of smaller pipe. Work will be carried out in connection with new 10,000,000 cu. ft. gas holder, 220 ft. diameter and 344 ft. high, for which award has just been made to Stacey Brothers Gas Construction Co., Cincinnati, New propane gas-mixing plant also will be built. Entire project will cost about \$1,000,000.

F.o.b. Prob. Carlotte Carlotte

F.o.b. Pi F.o.b. Ch F.o.b. Ga F.o.b. M F.o.b. Cl F.o.b. Bu F.o.b. Bi F.o.b. ca F.o.b. ca

Straight

Cold Fi

F.o.b. Pi F.o.b. Ch F.o.b. Du F.o.b. Bi F.o.b. H Galvest F.o.b. Mc F.o.b. N Corpus F.o.b. ca

P.o.b. Pi P.o.b. Ch F.o.b. G Del'd Ch F.o.b. Sp Del'd Ph Del'd Ne P.o.b. B F.o.b. ca Wrought

Belmont Quadrangle Drilling Co., Bradford, Pa., J. B. Cleaves, secretary, plans installation of 6½-in. steel pipe in connection with development of natural gas properties near Leon, N. Y., where well-drilling will soon begin, for natural gas transmission. Entire project will cost over \$200,000.

Sask., plans to begin work early in spring on new welded steel pipe line from Bowdoin natural gas field area, near Glasgow, Mont., to Regina and Moose Jaw, about 185 miles, for municipal gas supply. Project will include distributing lines in both communities.

communities.

Canadian Western Natural Gas Co., Ltd., Calgary, Alta., plans installation of new welded steel pipe lines in connection with development of natural gas properties near Calgary and at Edmonton, Alta. Entire project will cost over \$350,000.

Berea, Ohio, closes bids March 16 for 2800 ft. of 6 to 12-in. spiral welded steel pipe, in connection with new sewage disposal works for which bids are being asked at same time. R. F. MacDowell, Chester-Twelfth Building, Cleveland, is consulting engineer.

Arcadia, Cal., 500 tons, to Southwest

Arcadia, Cal., 500 tons, to Southwest Welding & Mfg. Co.

Chicago will take bids March 18 on 20,000 ft. of 2-in. standard steel pipe and 25,000 ft. of 2½-in. steel pipe.

Steel Demand Better At Birmingham

BIRMINGHAM, March 10.—Steel buying varies little from the rate of the past several weeks. There is a fair run of daily orders for general lines of steel such as sheets, wire products, plates, bars and structural shapes. The second quarter is yet too young for a new buying movement to start. Jobbers and dealers are still well stocked with sheets and wire products, consumer buying having been slow for more than two months on account of bad weather. This should now improve, with spring weather prevailing.

A few second quarter orders have been booked for pig iron, but present buying is light, both for current deliveries and for the next period, as orders already placed cover immediate needs in most cases. The base price for pig iron is \$15.50, no change having been made for the next quarter.

Twelve blast furnaces and 15 open-hearths are operating. This schedule has been in effect for the past month.

98-THE IRON AGE, March 12, 1936

Prices of Finished Steel and Iron Products

	es of finished st
BARS, PLATES, SHAPES	Steel Sheet Piling
Iron and Steel Bars	F.o.b. Pittsburgh
Soft Steel Base per Lb.	F.o.b. Buffalo
Soft Steel Base per Lb.	F.o.b. Pittsburgh 2.15c. F.o.b. Chicago 2.25c. F.o.b. Buffalo 2.25c. F.o.b. cars dock Gulf ports 2.60c. F.o.b. cars dock Pacific ports 2.60c.
F.a.b. Chiesgo 1.99c. F.a.b. Gary 1.99c. F.a.b. Duluth 2.00c. F.a.b. Duluth 2.00c. F.a.b. Cleveland 1.90c. F.a.b. Buffalo 1.95c. F.a.b. Cleveland 2.16c. F.a.b. Buffalo 2.20c. F.a.b. Bir.lingham 2.20c. F.a.b. cars Pacific ports 2.25c. F.a.b. cars Pacific ports 2.40c. F.a.b. cars Pacific ports 2.4	SHEETS, STRIP, TIN PLATE
Del'd Detroit	TERNE PLATE
r.o.b. Buffalo	
Del'd Philadelphia	Sheets
F.o.b. Bir lingham	Hot Rolled Base per Lb. No. 10, f.o.b. Pittsburgh1.85c.
F.o.b. cars Pacific ports2.40c.	No. 10, f.o.b. Pittsburgh
Rail Steel	No. 10, f.o.b. Gary 1.95c. No. 10, del'd Detroit 2.05c. No. 10, del'd Phila 2.16c. No. 10, f.o.b. Birmingham 2.00c. No. 10, f.o.b. cars dock Pacific ports.2.40c.
(For merchant trade)	No. 10, der d Phila
For merchant trade F.a.b. Pittaburgh 1.70c. F.a.b. Chicago 1.75c. F.a.b. Gary 1.75c. F.a.b. Olime, III. 1.75c. F.a.b. Cleveland 1.75c. F.a.b. Burialo 1.80c. F.a.b. Birmingham 1.85c. F.a.b. cars dock Gulf ports 2.10c. F.a.b. cars dock Pacific ports 2.25c. F.a.b. cars dock	No. 10, f.o.b. cars dock Pacific ports.2.40c.
P.o.b. Gary	Hot-Rolled Annealed
F.e.b. Cleveland	No. 24, f.o.b. Pittsburgh2.40c. No. 24, f.o.b. Gary
Fab. Birmingham	No. 24, del'd Detroit2.45c, to 2,60c.
F.a.b. cars dock Gulf ports2.10c.	No. 24, f.o.b. Birmingham2.55c.
F.O.D. CHI'S COOK Pacing posterior	No. 24, f.o.b. Pittsburgh 2.40c. No. 24, f.o.b. Gary 2.50c. No. 24, del'd Detroit 2.45c. to 2.60c. No. 24, del'd Phila. 2.71c. No. 24, f.o.b. Birmingham 2.55c. No. 24, f.o.b. cars dock Pacific ports.3.05c. No. 24, t.o.b. cars dock Pacific ports.3.05c. No. 24, wrought iron, Pittsburgh 4.30c.
Billet Steel Reinforcing	Heavy Cold-Rolled
(Straight lengths as quoted by distributors)	No. 10 gage, f.o.b. Pittshurgh 2 50c
F.o.b. Chicago	No. 10 gage, f.o.b. Pittsburgh 2.50c. No. 10 gage, f.o.b. Gary 2.60c. No. 10 gage, f.o.b. Detroit, 2.55c. to 2.70c. No. 10 gage, f.o.b. Birmingham 2.81c. No. 10 gage, f.o.b. Birmingham 2.65c. No. 10 gage, f.o.b. cars dock Pacific
Del'd Detroit	No. 10 gage. del'd Phila2.81c.
F.o.b. Youngstown	No. 10 gage, f.o.b. Birmingham 2.65c.
F.o.b. Buffalo	ports3.10e.
(Straight lengths as quoted by distributors) F.a.b. Pitsburgh 2.05c. F.a.b. Chicago 2.10c. F.a.b. Chicago 2.10c. F.a.b. Clay 2.10c. F.a.b. Cleveland 2.20c. F.a.b. Youngstown 2.10c. F.a.b. Birmingham 2.10c. F.a.b. Birmingham 2.10c. F.a.b. cars dock Gulf ports 2.45c. F.a.b. cars dock Pacific ports 2.45c.	Light Cold-Rolled
F.O.D. Cars dock Patine potts	No. 20 gage, f.o.b. Pittsburgh 2.95c. No. 20 gage, f.o.b. Gary 3.05c. No. 20 gage, del'd Detroit, .3.00c. to 3.15c. No. 20 gage, del'd Phila 3.26c. No. 20 gage, f.o.b. Birmingham 3.10c. No. 20 f.o.b. cars dock Pacific ports.3.50c.
Rail Steel Reinforcing	No. 20 gage, del'd Detroit3.00c. to 3.15c.
(Straight lengths as quoted by distributors)	No. 20 gage, del'd Phila
P.o.b. Chicago	No. 20 f.o.b. cars dock Pacific ports.3.50c.
(Straight lengths as quoted by distributors) Fo.b. Pittsburgh 1.90c Fo.b. Chicago 1.95c Fo.b. Chicago 1.95c Fo.b. Cleveland 1.95c Fo.b. Voungstown 1.95c Fo.b. Burfalo 1.95c Fo.b. Birmingham 1.95c Fo.b. ears dock Gulf ports 2.30c Fo.b. ears dock Pacific ports 2.30c	Galvanized Sheets
F.o.b. Youngstown	No. 24 gage, f.o.b. Pittsburgh3.10c.
F.o.b. Birmingham	No. 24, f.o.b. Gary
F.o.b. cars dock Pacific ports2.30c.	No. 24, f.o.b. Birmingham3.25c.
Iron	No. 24 gage, f.o.b. Pittsburgh .3.10c. No. 24, f.o.b. Gary .3.20c. No. 24, del'd Phila .3.4tc. No. 24, f.o.b. Birmingham .3.25c. No. 24, f.o.b. cars dock Pacific ports. 3.70c. No. 24, wrought iron, Pittsburgh 4.95c .4.95c
F.a.b. Chicago	Long Ternes
F.o.b. Chicago 1.80c. F.o.b. Pittsburgh (refined) 2.10c. Delivered New York 2.05c. Delivered Philadelphia 2.10c.	No. 24, unassorted 8-lb, coating
Delivered Philadelphia2.10c.	No. 24, unassorted 8-lb, coating f.o.b, Pittsburgh 3.40c F.o.b, Gary 3.50c F.o.b, cars dock Pacific ports 4.10c
Cold Finished Bars and Shafting*	F.o.b. cars dock Pacific ports4.10c.
Base see Th	Vitreous Enameling Stock
F.o.b. Pittsburgh	No. 20, f.o.b. Pittsburgh 2.95e No. 20, f.o.b. Gary 3.05e No. 20, f.o.b. Birmingham 3.55e No. 20, f.o.b. cars dock Pacific 3.55e
F.o.b. Gary	No. 20, f.o.b. Birmingham3.55e
F.o.b. Gary 2.15c. F.o.b. Cleveland 2.15c. F.o.b. Buffalo 2.20c. Del'd Detroit 2.30c.	No. 20, f.o.b. cars dock Pacific
Del'd Detroit	No. 20, f.o.b. ears dock Pacific ports
	No. 10, f.o.b. Birmingham2.95c
 In quantities of 10,000 to 19,999 lb. 	ports2.95c
Fence and Sign Posts	
rence and Sign Posts	Tin Mill Black Plate
Angle Line Posts	
Angle Line Posts	No. 28, f.o.b. Pittsburgh 2.75c No. 28, Gary
Angle Line Posts	No. 28, f.o.b. Pittsburgh 2.75c No. 28, Gary 2.85c No. 28, cars dock Pacific Coast 3.35c ports 3.35c
Angle Line Posts	No. 28, f.o.b. Pittsburgh 2.75c No. 28, Gary 2.85c No. 28, cars dock Pacific Coast ports 3.35c Tin Plate
Angle Line Posts	No. 28, f.o.b. Pittsburgh
Angle Line Posts F.o.b. Pittsburgh Base per Net Ton F.o.b. Chicago \$54.00 F.o.b. Duluth 55.00 F.o.b. Cleveland 54.00 F.o.b. Birminsham 54.00 F.o.b. Houston, Orange, Beaumont,	No. 28, f.o.b. Pittsburgh
Angle Line Posts F.o.b. Pittsburgh Base per Net Ton F.o.b. Chicago \$54.00 F.o.b. Duluth 55.00 F.o.b. Cleveland 54.00 F.o.b. Birminsham 54.00 F.o.b. Houston, Orange, Beaumont,	No. 28, f.o.b. Pittsburgh
Angle Line Posts F.o.b. Pittsburgh Base per Net Ton F.o.b. Chicago \$54.00 F.o.b. Duluth 55.00 F.o.b. Cleveland 54.00 F.o.b. Birminsham 54.00 F.o.b. Houston, Orange, Beaumont,	No. 28, f.o.b. Pittsburgh
### Angle Line Posts Base per Net Ton	No. 28, f.o.b. Pittsburgh
### Angle Line Posts Base per Net Ton	No. 28, f.o.b. Pittsburgh
### Angle Line Posts Base per Net Ton	No. 28, f.o.b. Pittsburgh
### Angle Line Posts Base per Net Ton	No. 28, f.o.b. Pittsburgh
### Angle Line Posts Base per Net Ton	No. 28, f.o.b. Pittsburgh
### Angle Line Posts Base per Net Ton	No. 28, f.o.b. Pittsburgh
### Angle Line Posts Base per Net Ton	No. 28, f.o.b. Pittsburgh 2.75c
### Angle Line Posts Base per Net Ton	No. 28, f.o.b. Pittsburgh
### Angle Line Posts Base per Net Ton	No. 28, f.o.b. Pittsburgh
## Base per Net Ton F.a.b. Pittsburgh	No. 28, f.o.b. Pittsburgh
## Base per Net Ton F.a.b. Pittsburgh	No. 28, f.o.b. Pittsburgh
## Base per Net Ton F.a.b. Pittsburgh	No. 28, f.o.b. Pittsburgh
## Base per Net Ton F.a.b. Pittsburgh	No. 28, f.o.b. Pittsburgh
## Base per Net Ton F.a.b. Pittsburgh	No. 28, f.o.b. Pittsburgh
## Angle Line Posts Base per Net Ton	No. 28, f.o.b. Pittsburgh
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## Angle Line Posts Base per Net Ton	No. 28, f.o.b. Pittsburgh
## Angle Line Posts Base per Net Ton	No. 28, f.o.b. Pittsburgh
## Angle Line Posts Base per Net Ton	No. 28, f.o.b. Pittsburgh 2.75c No. 28, Gary 2.85c No. 28, cars dock Pacific Coast ports 3.35c Tin Plate Standard cokes, f.o.b. P'gh district mill \$5.2: Standard cokes, f.o.b. Gary \$5.2: Standard cokes, f.o.b. cars dock Pacific ports 5.9: Terne Plate (P.o.b. Pittsburgh) (Per Package, 20 x 28 in.) 8-lb. coating I.C. \$10.0 15-lb. coating I.C. \$10.0 25-lb. coating I.C. 13.0 25-lb. coating I.C. 14.0 30-lb. coating I.C. 15.2 40-lb. coating I.C. 15.2 40-lb. coating I.C. 15.2 40-lb. coating I.C. 15.2 41 widths up to 24 in. P'gh 1.85c All widths up to 24 in. Chicago 1.95c All widths up to 24 in. Birming- ham 2.05c All widths up to 24 in. Birming- ham 2.05c Cooperage stock, Pittsburgh 1.95c Cooperage stock, Pittsburgh 1.95c Cooperage stock, Chekago 2.05c Cold-Rolled Strips Base per Lt F.o.b. Pittsburgh 2.600 Pc)b. Cleveland 2.600 Del'd Chicago 2.895 F.o.b. Worcester 2.800
## Angle Line Posts Base per Net Ton	No. 28, f.o.b. Pittsburgh 2.75c No. 28, Gary 2.85c No. 28, cars dock Pacific Coast ports 3.35c Tin Plate Standard cokes, f.o.b. P'gh district mill \$5.2: Standard cokes, f.o.b. Gary \$5.2: Standard cokes, f.o.b. cars dock Pacific ports 5.9: Terne Plate (P.o.b. Pittsburgh) (Per Package, 20 x 28 in.) 8-lb. coating I.C. \$10.0 15-lb. coating I.C. \$10.0 25-lb. coating I.C. 13.0 25-lb. coating I.C. 14.0 30-lb. coating I.C. 15.2 40-lb. coating I.C. 15.2 40-lb. coating I.C. 15.2 40-lb. coating I.C. 15.2 41 widths up to 24 in. P'gh 1.85c All widths up to 24 in. Chicago 1.95c All widths up to 24 in. Birming- ham 2.05c All widths up to 24 in. Birming- ham 2.05c Cooperage stock, Pittsburgh 1.95c Cooperage stock, Pittsburgh 1.95c Cooperage stock, Chekago 2.05c Cold-Rolled Strips Base per Lt F.o.b. Pittsburgh 2.600 Pc)b. Cleveland 2.600 Del'd Chicago 2.895 F.o.b. Worcester 2.800
## Angle Line Posts Base per Net Ton	No. 28, f.o.b. Pittsburgh

W	IRI	PR	00	U	CT	S
-	-	-				

(Carlos	d	lots	В,	ť.	.0	, b).	1	P	t	2.5	b	u	rgh	an	id	Cl	ere-
2	ro	Mo	7711	uj	a	cż	u	ri	22	a		T	80	ide		Pe	r.	Lb.
Bright Spring																		40c. 05c.

Chicago prices on products sold to the manufacturing trade are \$1 a ton above Pittaburgh or Cleveland. Worcester and Duluth prices are \$2 a ton above, Hirmingham \$5 above, and Pacific Coast prices \$9 a ton above Pittaburgh or Cleveland.

В	ase per 10	O Lh
Annealed fence wire	\$2.45 to	\$2.6
Galvanized fence wire	2.80 to	3.0
Polished staples		2.8
Galvanized staples		3.0
Barbed wire, galvanized		2.6
Twisted barbless wire		2.6
Woven wire fence, base col-	umn	58.0
Single loop bale ties, base		51.0

Chicago and Anderson, Ind., mill prices are \$1 a ton over Pittsburgh base (on all products except woven wire fence, for which the Chicago price is \$2 above Pittsburgh; Duluth. Minn., mill prices are \$2 a ton over Pittsburgh except for woven wire fence, which is \$3 over Pittsburgh, and Birmingham mill prices are \$3 a ton over Pittsburgh.

On wire nails, barbed wire and staples, prices at Houston, Galveston and Corpus Christi, Tex., New Orleans, Lake Charles, La., and Mobile, Ala., are \$6 a ton over Pittsburgh.

On nails, staples and barbed wire prices of \$6 a ton above Pittsburgh are also quoted at Beaumont and Orange, Tex

STEEL AND WROUGHT IRON PIPE AND TUBING

Welded Pipe

Base Discounts, f.o.b. Pittsburgh District and Lorain, Ohio, Mills

F.o.b. Pittsburgh only on wrought fron pipe.

Butt Weld

Inches Black		Wrought Iron Inches Black Galv.
1/4 to 3/4	55 59	$\frac{1}{14}$ & $\frac{1}{4}$ + $\frac{91}{2}$ + $\frac{138}{14}$ & $\frac{1}{4}$ + $\frac{11}{2}$ + $\frac{21}{12}$ + $\frac{11}{2}$ + $\frac{21}{12}$ + $\frac{21}{12}$ + $\frac{21}{12}$ + $\frac{21}{14}$ + $\frac{21}{1$

Lap Weld

		2 1/2 to 31/2 38	
	58%	4 to 8 40	2814
9 and 10651/2	56		

Butt Weld, extra strong, plain ends

1/2		421/4 1/4 + 13 + 45	1
34	to % 571/2	461/2 14 & 1/2 + 34	1
1/2	621/2	54 1/2 1/2 32 1/2 17	
3/4		58½ ¾37½ 22 61 1 to 243½ 29	
1 1	0 368	61 1 to 243½ 29	١

Lap Weld, extra strong, plain ends

21/2 to 3	64 56%	2 2 1/2 to 4 4 1/2 to 6	451/2	26 33 33
7 and 8	66½ 57 65½ 56	7 & 8 9 to 12.	46	33

On butt-weld and lap-weld steel pipe jobbers are granted a discount of 5%. On less-than-carload shipments prices are determined by adding 20 and 25% and the carload freight rate to the base card.

Note—Chicago district mills have a base two points less than the above discounts. Chicago delivered base is 2½ points less. Freight is figured from Pittaburgh, Lerain. Ohio, and Chicago district mills, the billing being from the point preducing the lowest price to destination.

Seamless Stee	cl Commerc		Tubes
(Net base pr	ices per 100 gh in carlos		Pitta-
1½ in. o.d. 1¾ in. o.d. 2 in. o. d.	13 B.W.G. 13 B.W.G. 13 B.W.G. 12 B.W.G. 12 B.W.G. 12 B.W.G. 12 B.W.G. 10 B.W.G. 10 B.W.G. 10 B.W.G. 10 B.W.G. 10 B.W.G. 10 B.W.G.	10.19 11.26 12.81 14.35 16.00 17.61 19.29 20.45 21.45 41.08 27.09 33.60 41.08 51.56	14.54 16.91 17.54 18.59 19.58 37.35

Boiler Tubes

Ext	ras f	or les	s-carlos	d qu	antit	les:	
	lb. or lb. or lb. or	ft. to	24,999 11,999 5,999	lb. o lb. o	r ft. r ft.	121/2 25 35	% %

Lapweld Steel and Knobbled Charcoal Iron Pressure Tubes (Net base prices per 100 ft. f.o.b. Pitts-

	gh, in carload l		
		Steel	Iron
11/2 in. o.d.	13 B.W.G	9.72	\$20.10
1% in. o.d.	13 B.W.G	11.06	21.8
2 in, o.d.	13 B.W.G	12.38	17.23
214 in. o.d.	13 B.W.G	13.79	19.58
21/2 in. o.d.	12 B.W.G		24.19
2% in. o.d.	12 B.W.G	17.54	26.40
3 in. o.d.	12 B.W.G		28.39
3¼ in. o.d.	11 B.W.G	21.56	33.9
31/2 in. o.d.	11 B.W.G		36.10
	10 B.W.G		45.30
41/2 in. o.d.	10 B.W.G		
5 in o.d.	9 B.W.G	44.25	61.8
a in ad	7 D W C		109 4

Quantity Extras:

40,000	lb.	or ft.			base	
25,000	1b. 0	or ft.	to	39,999	lb.	
or f	t				plus	5%
10.000	1b. 0	or ft.	to	24.999	lb.	
or ft					plus	121/2%
2,000	lb. c	or ft.	to	9,999	Ib.	
or f	t				plus	25%
Tinder	9 000	Th. o	P 2		กในธ	40%

CAST IRON WATER PIPE

Per Net Ton
*6-in, and larger, del'd Chicago\$48.00
*4-in del'd Chicago 51.40
6-in. and larger, del'd New York. 45.29
4-in., del'd New York 48.20
*6 in, and larger, Birmingham 40.00
*4-in. Birmingham 43.00
6-in, and larger, f.o.b. dock, San
Francisco or Los Angeles 48.00
F.o.b. dock. Seattle 48.50
4-in., f.o.b. dock, San Francisco or
Los Angeles
F.o.b. dock, Seattle 51.50
Class "A" and gas pipe, \$3 extra.
Class A and gas pipe, so extra.

Prices for lots of less than 200 tons. For 200 tons and over, 6-in. and larger is 339. Birmingham, and \$47.40. delivered Chicago, and 4-in. pipe, \$42. Birmingham, and \$50.40 a ton, delivered Chicago.

RAILROAD MATERIALS

Rails and Track Supplies F.o.b. Mill

Standard	rails,	hear	rier	than	1 60	16		
per gr	oss to	n					336.374	ŝ
Angle ba	rs. pe	r 100	lb.				. 2.55	

F.o.b. Code Basing Points

Light	Lama	(III)	m n	IIIGES	her	Bru	00 00
ton							\$35.00
gross	ton						34.00
					Base	per 1	00 Lb.
OC	0.19			A Sam			00 00

			Bo	186	per	100	Lb.
Spikes	. 9/16 i	n. and	large	r			2.60
	. 1/2 an						
Tie pl	ates, ste	el					1.90
Tie pl	ates. Pa	cific Cor	ast po	orts		000	2.09
	bolts, to						3.60
Track	bolts, no	jobbers	, all s	size	s (per	
130	counts)		70	per	cer	it of	list

BOLTS, NUTS, RIVETS AND SET

2CKEW2	
Bolts and Nuts (F.o.b. Pittsburgh, Cleveland, Birming- ham or Chicago) Per Cent Off List	
Machine and carriage bolts: ½ in. x 6 in. and smaller70, 10 and 5	
Larger than ½ in	
heads	
Bot-pressed nuts, blank or tapped, hexa-	
C.p.c. and t. square or hex. nuts, blank	-
or tapped	-
Stove bolts in packages, Pittsburgh 72% and 10	
Stove bolts in packages, Chicago, 72½ and 10	
Stove bolts in packages, Cleveland, 72½ and 10	
Store bolts in bulk, Pittsburgh. $82\frac{1}{2}$ Store bolts in bulk, Chicago. $82\frac{1}{2}$ Store bolts in bulk, Cleveland. $82\frac{1}{2}$ Tire bolts	
Large Rivets	
F.o.b. Pittsburgh or Cleveland. \$2.90 F.o.b. Chicago	
Per Cent Off List	

Per Cent Off List	
F.o.b. Pittsburgh70 and 5	- 1
F.o.b. Cleveland70 and 5	
F.o.b. Chicago and Birm'g'm 70 and 5	
2.0.0. Chicago and Diring in 10 and 5	
Cap and Set Screws	
(Freight allowed up to but not exceeding	
65c, per 100 lbs. on lots of 200 lb. or more)	
Per Cent Off List	
Milled cap serews, 1 in. dia. and	
matted cap serews, I in. dia. and	
smaller	
Milled standard set screws, case hard-	
ened, 1 in. dia. and smaller 75	
Milled headless set screws, cut thread	
% in. and smaller 75	
Upset hex. head tap screws U.S.S. or	
S.A.E. thread, 1 in. and smaller 85	
Upset set screws, cut and oval	
points	
Milled studs	

Alloy and Stainless Steel Alloy Steel Ingots F.o.b. Pittsburgh, Chicago, Canton,

Massillon, Buffalo, Bethlehem.
Uncropped\$40 per gross ton Alloy Steel Blooms, Billets
Alloy Steel Blooms, Billets
and Slabs
F.o.b. Pittsburgh, Chicago, Canton
Massillon, Buffalo, Bethlehem.
Base price, \$49 a gross ton.
Alloy Steel Bars
Price del'd Detroit is \$52.
F.o.b. Pittsburgh, Chicago, Buffalo,
Bethlehem, Massillon or Canton.
Open-hearth grade, base2.45c.
Delivered price at Detroit is 2.60c.
S.A.E. Alloy
Series Differential
Numbers per 100 lb. 2000 (½% Nickel) \$0.25 2100 (2½% Nickel) 0.93 2300 (3½% Nickel) 1.55 2500 (5% Nickel) 1.55
2100 (2½% Nickel) 0.95
2300 (31/2 Nickel) 1.50
2500 (5% Nickel) 2.25
3100 Nickel Chromium 0.55
3200 Nickel Chromium 1.35
3100 Nickel Chromium 0.5 3200 Nickel Chromium 1.3 3300 Nickel Chromium 3.80
3400 Nickel Chromium 3,20
4100 Chromium Molybdenum (0.15
3400 Nickel Chromium 3.20 4100 Chromium Molybdenum (0.15 to 0.25 Molybdenum) 0.50
to 0.40 Molybdenum) 0.70 4600 Nickel Molybdenum (0.20 to 0.30) Molybdenum (1.50 to
4600 Nickel Molybdenum (0.20 to
0.30) Molybdenum (1.50 to
2.00 Nickel) 1.05
5100 Chromium Steel (0.60 to
0.90 Chromlum) 0.35 5100 Chromium Steel (0.80 to
1.10 Chromium) 0.45
5100 Chromium Spring Steel base
6100 Chromium Vanadium Bar 1.10c.
6100 Chromium Vanadium Spring
Steel 0.70
Chromium Nickel Vanadium 1 40
Chromium Nickel Vanadium 1.40 Carbon Vanadium 0.85
These prices are for hot-rolled steel
bars. The differential for most grades in
electric furnace steel is 50c higher The
differential for cold-drawn bars 1/4c per
differential for cold-drawn bars ½c. per lb. higher with separate extras. Blooms,
billets and slabs under 4x4 in. or equiv-

billets and slabs under 4x4 in, or equivalent are sold on the bar base. Slabs with a section area of 16 in, and 2½ in, thick or over take the billet base. Sections 4x4 in, to 10x10 in, or equivalent carry a gross ton price, which is the net price for bars for the same analysis. Larger sizes Alloy Cold-Finished Bars
F.o.b. Pittsburgh, Chicago, Gary, Cleveland or Buffalo, 2,95c, base per lb.

						400	Brein we		
	ST	AINL	ESS	ST	EE	L	No.	302	
17	to	19%	Cr.	7 1	to	9%	NI.	0.08	1
			0.5	1000	C	1			

(Base Price	88	ſ.	0	l.	b.		1	P	1	tt	S	h	U	ľ	g			
Forging billets .																1	Per	L
LOIBING DITTELL .	*				*	*	*				*	*				*	TO.	
Bars											٠							23
Plates																		26
Structural shapes	ś																	23
sheets																		33
Hot-rolled strip			Ē								í						.20	3/
			*	*	*	*	*	۰	*	*	٠	۰	٠	٠	۰	×		74
Cold-rolled strip					۰					٠	۰							27

Raw and Semi-Finished Steel

	INDA ALICA SCIIII
	Billets, Blooms and Slabs
	F.o.b. Pittsburgh, Chicago, Gary, Cleveland, Youngstown, Buffalo, Birmingham.
	Per Gross Ton
	Delivered Detroit
	Rerolling
	Billets Only F.o.b. Duluth
	Rerolling\$30.00 Forging
•	Sheet Bars
)	F.o.b Pittsburgh, Chlcago, Cleveland, Youngstown, Buffalo, Canton, Sparrows Point, Md.
)	Open-hearth or Bessemer \$28.00

							-	3	k	•	ı	p	,														
F.o.b. Buffalo, Md.																											
Grooved																							l		18		
			0	0	0	0		0	0	0	0	0	0	0	0		0				0		0				
Universal	0	0	0	۵	0	10		0	0	0	0	0			0	0	0	0	10	٠	۰	0	۰		.8		
Sheared								.0	0					0	0	0			0		0			1	.8	0c	

Wire Rods (Nos. 4 and 5)

	Per Gross To
F.o.b.	Pittsburgh\$38.0
F.o.b.	Cleveland 38.0
F.o.b.	Chicago 39.0
F.o.b.	Anderson, Ind 39.0
	Youngstown 39.0
F.o.b.	Worcester, Mass 40.0
F.o.b.	Birmingham 41.6
F.o.b.	
F.o.b.	Galveston 44.0

Pig Iron and Ferroalloys

PIG IRON

PRICES PER GROSS TON AT BASING POINTS

TRICES TER OR	1033 1014	MI DASING	POINTS	
Basing Points	No. 2 Fdry.	Malleable	Basic	Bessemen
Everett, Mass	\$20.50	\$21.00	\$20.00	\$21.50
Bethlehem, Pa	20.50	21.00	20.00	21.50
Birdsboro, Pa	20.50	21.00	20.00	21.50
Swedeland, Pa	20.50	21.00	20.00	21.50
Steelton, Pa		****	20.00	****
Sparrows Point, Md	20.50		20.00	
Neville Island, Pa	19.50	19.50	19.00	20.00
Sharpsville, Pa	19.50	19.50	19.00	20.00
Youngstown	19.50	19.50	19.00	20.00
Buffalo	19.50	20.00	18.50	20.50
Erie, Pa	19.50	20.00	19.00	20.50
Cleveland	19.50	19.50	19.00	20.00
Toledo, Ohio	19.50	19.50	19.00	20.00
Jackson, Ohio	21.25	21.25	20.75	
Detroit	19.50	19.50	19.00	20.00
Hamilton, Ohio	19.50	19.50	19.00	20.00
Chicago	19.50	19.50	19.00	20.00
Granite City, Ill	19.50	19.50	19.00	****
Duluth, Minn	20.00	20.00		20.50
Birmingham	15.50	15.50	14.50	20.00
Provo, Utah	17.50	****	17.00	****

DELIVERED PRICES PER GROSS TON AT CONSUMING CENTERS

	No. 2 Fdry.	Malleable	Basic	Bessemer
Boston Switching District From Everett, Mass	\$21.00	\$21.50	\$20.50	\$22.00
Brooklyn From Eastern Pa	22.9289	23.4289	****	
Newark or Jersey City, N. J. From Eastern Pa	21.9873	22.4873	21.4873	22.9873
Philadelphia From Eastern Pa	21.3132	21.8132	20.8132	22,3132
Cincinnati From Hamilton, Ohio	20.5807	20.5807	20.0807	21.0807
Canton, Ohio From Cleveland and Youngstown	20.8482	20.8482	20.3482	21.3482
Columbus, Ohio From Hamilton, Ohio	21.64	21.64	****	
Mansfield, Ohio From Cleveland and Toledo	21.3832	21.3832	20.8832	21.8832
Indianapolis From Hamilton, Ohio	21.9289	21.9289		
South Bend, Ind. From Chicago	21.6935	21.6935	****	
Milwaukee From Chicago	20.57	20.57		
St. Paul From Duluth	21.94			
Davenport, Iowa From Chicago	21.3832	21.3832		
Kansas City From Granite City	22.2178	22.2178		
San Francisco, Los Angeles or Seattle. From Provo	22.315			

Delivered prices on Southern iron for shipment to Northern points are 38c, a grotton below delivered prices from the nearest Northern basing points.

LOW PHOSPHORUS PIG IRON

Basing points: Birdsboro, Pa., Steelton, Pa., and Standish, N. Y....\$24.00

GRAY FORGE PIG IRON

	SEATOR A. V.			400.00.0	
Valley	furnace				.\$19.00
Pittsb	urgh dis	trict furns	ice		. 19.00

CHARCOAL PIG IRON

Lake Superior furnace \$22.00
Delievered Chicago 25.252
Delivered Buffalo 25.595

CANADA

Pig Iron

	1 61	38	000 6	044								
				De	livere	d T	oro?	nt	0			
	No.	1	fdy.,	sil.	2.25	to	2.7	5.		 		\$21.0
	No.	13	fdy	sil.	1.75	03	2.7	5,				20 8
	Mal	lea	ble					* *		• •	*	22.5
				Del	lvere	d M	lont	re	al			
	No.	1	fdy.,	sil.	2.25	to	2.7	5.				\$22.5
*-	No.	22	fdy	S11.	1.40	to	2.2	ō.				22.0

FERROALLOYS

Ferromanganese

			and an arrest	
F.o.b. more, Mo	New bile o	York, r New	Philadelphia, Orleans,	Balti-
Domestie,			Per Gro	

Spiegeleisen

		Per Gros	s Ton	Furnace
Domestic,	19 to 21	90		\$26.00
50-ton	lots 3-mo.	shipmer	16	24.00
F.o.b. Ne	w Orleans	*******		26.00

Electric Ferrosilicon

			1	P	e	r	-	Ŧ.	r	01	9.5	1	I	9	ķ	1	D	16	livered
	(carloads)																		
																			. 85.0
	(carloads)																		
75%	(ton lots)	٠						0			0								.136.0

Silvery Iron F.o.b. Jackson, Ohio, Furnace

	oss Ton	Per Gross Ton
6.01 to 6.50% 6.51 to 7.00% 7.00 to 7.50% 7.51 to 8.00% 8.00 to 8.50% 8.51 to 9.00% 9.51 to 10.00% 10.00 to 10.50% 11.00 to 11.50% 11.51 to 11.00%	\$22.75 23.25 23.75 24.75 24.75 25.25 26.25 26.25 26.25 27.75	12% \$29.75 13% 30.75 14% 32.25 15% 33.75 16% 35.25 17% 36.75

The lower all-rail delivered price from Jackson or Buffalo is quoted with freight allowed. Base prices at Buffalo are \$1.25 a ton higher than at Jackson.

Manganese 2 to 3%, \$1 a ton additional, For each unit of manganese over 3%, \$1 a ton additional. Phosphorus 0.75% or over, \$1 a ton additional.

Bessemer Ferrosilicon F.o.b. Jackson, Ohio, Furnace

Per Gro	ss Ton	Per Gross Ton
10.00 to 10.50%	\$27.75	13% \$31.75
10.51 to 11.00%	28,15	14% 33.25
11.00 to 11.50%	28.75	15% 34.75
11.51 to 12.00%	29.25	16% 36.25
12%	. 30.25	17% 37.75
Manganese 2	to 3%.	\$1 a ton addi-
tional. For each	unit of	manganese over
3%, \$1 a ton	addition	nal. Phosphorus

Manganese 2 to 3%, \$1 a ton additional. For each unit of manganese over 3%, \$1 a ton additional. Phosphorus 0.75% or over, \$1 a ton additional. Base prices at Buffalo are \$1.25 a ton higher than at Jackson.

Other Ferroalloys

ner	del., carloads \$1.30
-	Ferrotungsten, lots of 5000 lb 1.35
0	Ferrotungsten smaller lots 1.40
	Ferrochromium, 4 to 6% carbon and up, 65 to 70% Cr per lb. contained Cr delivered, in car
873	loads, and contract 10.00c. Ferrochromlum, 2% carbon
132	Personalum 10
807	carbon
182	Ferrochromium, 0.06% carbon
.	Ferrovanadium, del. per lb. contained V\$2.70 to \$2.90
832	Ferrocolumbium, per lb. contained columbium, f.o.b. Niagara Falls, N. Y
	Ferroarbontitanium. 15 to 18%
.	Ferrocarbontitanium, 17 to 20% Ti.
	3 to 5% C, f.o.b. furnace, car- load and contract, per net ton 142.50
	Ferrophosphorus, electric, or blast furnace material, in carloads,
	f.o.b. Anniston, Ala., for 18%. with \$3 unitage, freight equalized with Rockdale, Tenn., per gross
	Ferrophosphorus, electric, 24%, in
	carlots, f.o.b. Anniston, Ala., per gross ton with \$3 unitage, freight equalized with Nashville,
OSS	Tenn 75.00 Ferromolybdenum, per lb. Mo. del. 95c.
	Calcium molybdate. per lb. Mo, del 80c.
	Silico spiegel, per ton, f.o.b. fur- nace, carloads
0	Silico-manganese, gross ton, deliv- ered.
528	2.50% carbon grade
95	Spot prices

Per gross to
No. 1 heavy
No. 2 beary
No. 2 beary
No. 2 relife
Serap rails
Estap rails
Estap rails
Estap rails
Estap rails
Estap
Hand bundli
Hry, steel
Machine sinc
Short mixe
urmings
Cast iron to
Cast iron to
Cast iron to
Cast iron to
Estap
No. 1 cast
Rail: knu
plers
Estap
Low phos. 2
Low phos. 3
Low phos. 4
Low phos. 4
Low phos. 4
Low phos. 5
Low phos. 5
Low phos. 5
Low phos. 5
Low phos. 6
Low phos

Heavy melti Automobile Shoveling 28 Hydraulle composition of the Market Market

Delivered C

Iron car axi
Steel car ax
No. 1 railro
No. 2 railro
No. 2 bush
Locomotive
Pipes and i
No. 1 mach
Clean autom
No. 1 railr
No, 1 agri
Store plate
Grate bars
Brake shoes

Per gross t

Dealers' but
No. 1 heavy
No. 2 heavy
No. 2 heavy
No. 2 heavy
Scrap rails
Loose sheet
Bundled she
Cast fron b
Machine sh
No. 1 bush
No. 2 bush
No. 1 bush
No. 1 locon
No. 1 rails
Burnt cast
Stove plate
Agricultural
Bailroad
Bailroad

Iron and Steel Scrap

PI	TT	SB	UR	GH

Per gress ton delivered con	sumers'	yards:
1 heavy melting steel. S	15.50 to	\$16.00
No. 2 heavy melting steel.	14.00 to	14.50
	15.50 to	16.00
Comen rails	15.75 to	16,25
note 2 ft. and under	16.50 to	17.00
Compressed sheet steel	15.50 to	16.00
grand hundled sheet steel	14.00 to	14.50
Hand bundled sheet steet Hry. steel axle turnings	13.50 to	
Machine shop turnings	10.50 to	
Short show. turnings	10.50 to	
Short mixed borings and		
turnings	8.25 to	9.25
Cast iron borings	10.50 to	
Cast iron carwheels	14.00 to	
Heavy breakable cast	13.00 to	
No. 1 cast	15.00 to	
Railr. knuckles and cou-	20.00	20.00
plers	17.25 to	17.75
Rail, coil and leaf springs	17.25 to	
Rolled steel wheels	17.25 to	
Low phos. billet crops	18.00 to	
Low phos. sheet bar crops	17.50 to	
Low phos. punchings	17.00 to	
Low phos. plate scrap	16.25 to	
Low phos. plate scrap	16.00 to	
Steel car axles	10.00 0	10.00

Balti-

nered 77.50 85.00 26.00 36.00

from reight \$1.25 ional. \$1 a over,

\$1.30 1.35 1.40

0.00c. 7.00c. 8.00c. 0.00a 0.50c. \$2.90 \$2.50 37,50 42.50

58.50

75.00 95c. 80c. \$38.00 45.50

CHICAGO

Delivered Chicago district co	onsumers: Per Gross Ton
- tulos steel 6	
Heavy melting steel	12.50 to 13.00
Shoveling steel	14.50 to 15.00
Shoveling steel	14.00 to 15.00
Hydraulic comp. sheets Drop forge flashings	12.00 to 12.50
No. 1 busheling	13.50 to 14.00
Rolled carwheels	16.00 to 16.50
Railroad tires	16.00 to 16.50
Railroad leaf springs	16.00 to 16.50
Arle turnings	13.00 to 13.50
Steel couplers and knuckles	16.00 to 16.50
Coil springs	16.50 to 17.00
Axie turnings (elec. fur.)	14.25 to 14.75
Low phos. punchings	17.00 to 17.50
Low phos. plates, 12 in.	21.00 10 21.00
and under	17.00 to 17.50
Cast iron borings	7.50 to 8.00
Short shoveling turnings	8.50 to 9.00
Machine shop turnings	7.50 to 8.00
Rerolling rails	15.50 to 16.00
Steel rails less than 3 ft.	17.25 to 17.75
Steel rails less than 2 ft.	17.50 to 18.00
Angle bars, steel	16.00 to 16.50
Cast fron carwheels	14.00 to 14.50
Railroad malleable	18.00 to 18.50
Agricultural malleable	14.50 to 15.00
mgitted at the same of the sam	
	Per Net Ton
Iron car axles	
Steel car axles	15.25 to 15.75
No. 1 railroad wrought	13.00 to 13.50
No. 2 railroad wrought	13.00 to 13.50
No. 2 busheling, old	7.50 to 8.00
Locomotive tires, smooth	13.00 to 13.50
Pipes and flues	8.00 to 8.50
No. 1 machinery cast	13.00 to 13.50
Clean automobile cast	12.50 to 13.00
No. 1 railroad cast	12.50 to 13.00
No. I agricultural cast	10.75 to 11.25
Store plate	8.00 to 8.50
Grate bars	9.50 to 10.00 9.75 to 10.25
Brake shoes	9.75 to 10.25

PHILADELPHIA

Per gross ton delivered con	sumers'	yards:
No. 1 heavy melting steel.	13.50 to	\$14.00
No. 2 heavy melting steel.	12.00 to	12.50
Hydraulic compressed, new		
Hydraulic compressed, old.	9.50 to	10.00
Steel rails for rolling	14.50 to	15.00
Cast fron earwheels	14.50 to	15,00
Heavy breakable cast	13.50 to	14.00
No. 1 cast	14.00 to	14.50
Store plate (steel works)	11.00 to	11.50
Railroad malleable	16.50 to	17.00
Machine shop turnings	8.00 to	
No. 1 blast furnace		6.25
Cast borings		6.00
Heavy axle turnings	10.25 to	
No. 1 low phos. heavy	17.00 to	17.50
Couplers and knuckles	17.00 to	17.50
Rolled steel wheels	17.00 to	17.50
Steel axles	16.50 to	17.00
Shafting	18.25 to	18.75
No. 1 railroad wrought	13.00 to	13.50
Spec, fron and steel pipe.	10.50 to	11.00
Bundled sheets	11.00 to	11.50
No. 1 forge fire Cast borings (chem.)	12.00 to	12.50
Case Dutings (chem.)	10.50 to	13.00

CINCINNATI	
Dealers' buying prices per gross ton:	
 No. 1 heavy melting steel \$12.00 to No. 2 heavy melting steel 10.00 to No. 2 heavy melting 11.50 to Scrap rails for melting 11.50 to Loose sheet clippings 8.00 to Bundled sheets 9.00 to Cast from borings 7.00 to Machine shop turnings 7.750 to No. 1 busheling 5.25 to No. 2 busheling 5.25 to Rails for rollings 12.00 to Rails for rollings 12.00 to Rails for rollings 12.00 to No. 1 becomes 12.00 to Rails for rollings 12.00 to No. 1 becomes 12.00 to No. 1 becomes	\$12,50 10,50 12,00 8,50 9,50 7,50 8,25 10,00
Short rails	15.50 12.00 13.00 12.25 9.25

CLEVELAND	
Per gross ton delivered consumers'	yards:
No. 1 heavy melting steel.\$14.75 to	\$15.25
No. 2 heavy melting steel, 13.75 to	14.25
Compressed sheet steel 14.50 to	15.00
Light bundled sheet stamp- ings	19.00
Drop forge flashings 13.50 to	14.00
Machine shop turnings 8.50 to	0.00
Short shoveling turnings. 9.00 to	9.50
No. 1 busheling 14.00 to	14.50
Steel axle turnings 13.00 to	13.50
Low phos, billet crops 17.50 to	18 00
Cast iron borings 9.00 to	
Mixed borings and short	0.00
turnings 9.00 to	
No. 2 busheling 9.00 to	
No. 1 cast 15.00 to	
Railroad grate bars 8.00 to	
Stove plate 9.00 to	
Rails under 3 ft 17.50 to	18.00
Rails for rolling 17.00 to	17.50
Railroad malleable 17.75 to	18.50
Cast iron carwheels	15.00
BUFFALO	

Per gross ton, f.o.b. Buffalo consumers'

BOSION		
Dealers' buying prices per gr	ross ton	:
*No. 1 heavy melting steel.\$1		
No. 1 heavy melting steel.		
*Scrap rails	10.75 to	11.00
Scrap rails	9.40 to	9.90
"No. 2 steel	9.75 to	
No. 2 steel	8.75 to	
Breakable cast		8.75
"Machine shop turnings		5.75
Machine shop turnings		4.40
Bundled skeleton, long	8.00 to	
Shafting		13.75
Engine blocks, stripped	8.00 to	
Cast iron borings, chemical		
Cotton ties		6.00
*Stove plate		7.00
Per gross ton delivered cons	umers'	yards:
Textile cast\$1	10.00 to	\$10.25
No. 1 machinery cast	10.00 to	10.50
Stove plate		

* Delivered local army base.

NEW YORK
Dealers' buying prices per gross ton:
Dealer's duying prices per gross ton:
No. 1 blast furnace 3.00 to 3.50
Cast borings (chemical) 10.00 to 11.00 Unprepared yard from and
steel 5.50 to 6.00
Per gross ton, delivered local foundries:
No. 1 machinery cast \$11.50 No. 1 hvy. cast (cupola
size) 9.50
No. 2 cast 8.00
† Leading on barge. \$1.00 to \$1.50 higher offered at nearby New Jersey points for rail shipments.
BIRMINGHAM

DIMMINATINA	
Per gross ton delivered consumers'	yards:
Heavy melting steel\$11.00 to	
Scrap steel rails 11.50 to	12.00
Short shoveling turnings	
Stove plates	
Steel axles 12.00 to	
Iron axles 12.00 to	12.50
No. 1 railroad wrought 8.50 to	
Rails for rolling 12.50 to	
No. 1 cast 12.00 to	12.50
Tramcar wheels 11.00 to	12.00

ST. LOUIS
Dealers' buying prices per gross ton de- livered consumers' works:
Selected heavy steel \$12.50 to \$13.00
DETROIT

Dealers' buying prices per gross ton: No. 1 heavy melting steel.\$12.00 to \$12.50

No. 2 heavy melting steel.\$10.75		
Borings and turnings		7.50
Long turnings 6.50	to	7.00
Short shoveling turnings 7.75	to	8.25
No. 1 machinery cast14.50	to	15.00
Automotive cast 14.50	to	15.00
Hydraulic comp. sheets 12.50	to	13.00
Stove plate 8.75	to	9.25
New factory busheling 11.00	to	11.50
Old No. 2 busheling 6.50	to	7.00
Sheet clippings 9.00	to	9,50
Flashings 11.25		
Low phos. plate scrap 12.50	to	13.00

CANADA

Dealers' buying prices per	gross '	ton:
T	oronto	Montreal
Heavy melting steel	\$7.50	\$7.00
Rails. scrap	8.50	
Machine shop turnings	4.00	4.00
Boiler plate	7.00	6.00
Heavy axle turnings	4.50	4.00
Cast borings	5.00	4.50
Steel borings	4.00	4.00
Wrought pipe	4.00	
Steel axles	8.50	
Axles, wrought iron		9.50
No. 1 machinery cast	11.50	11.00
Stove plate	7.50	7.00
Standard carwheels	11.00	10.50
Malleable	7.00	7.00
Shoveling steel	6.50	6.00
Bushelings	6.00	
Compressed sheets	6.50	6.00

ORES, FLUORSPAR, COKE, FUEL, CTORIES

	REFRA
	Lake Superior Ores
	Delivered Lower Lake Ports
	Per Gross Ton
Old r Mesal Mesal	nge, non-Bessemer, 51.50% iron. \$4.80 nge, non-Bessemer, 51.50% iron 4.65 l, Bessemer 51.50% iron 4.65 chosphorus, 51.50% iron 4.65 chosphorus, 51.50% iron 4.40
(i.f. Philadelphia or Baltimore Per Unit
to	low phos., copper free, 55 58% iron dry Spanish or tria
Iron.	low phos., Swedish, average % iron
Iron,	basic or foundry, Swedish,

Algeria10.2
Iron, low phos., Swedish, average
68½% iron10.2
Iron, basic or foundry, Swedish, aver. 65% iron 9.5
Iron, basic or foundry, Russian,
aver. 65% fron
Manganese, Caucasian, washed 52% 2
Manganese, African, Indian, 44-
48% 2
Manganese, African, Indian, 49-
51% 2
Manganese, Brazilian, 46 to 481/2 %
Per Net Ton U
Tungsten, Chinese, wolframite, duty
paid, delivered, nominal \$16
Tungsten, domestic, scheelite deliv-
rungsten, domestic, scheente denv-

Per Gross Ton
Chrome, 45% Cr2O3, lamp, c.i.f. Atlantic Seaboard (African) \$17.50 45 to 46% Cr2O3 (Turkish)
48% Cr2O3 (African) \$16.50 to \$17.00
48% min. Cr2Os (Turkish) 19.25
Chrome concentrate, 50% and over Cr2Os, c.i.f. Atlantic Seaboard, 22.00 52% Cr2Os (Turkish)
48 to 49% Cr2Os (Turkish) 19.25

Per Ne	t Tor
Domestic, washed gravel. 85-5, f.o.b. Kentucky and Illinois mines for all rail shipment	18.0
No. 2 lump. 85-5, f.o.b. Kentucky and Illinois mines Foreign, 85% calcium fluoride, not over 5% silicon, c.i.f. Atlantic	18.00
ports, duty paid	
21/2% silicon, f.o.b. Illinois and Kentucky mines	30.0

COKE, COAL	AND FUEL OIL
C	oke
	Per Net Ton
Furnace, f.o.b. Co Prompt Foundry, f.o.b. Co	\$3.65 to \$3.80
Prompt	4.25 to 5.75
Foundry, by-product ovens, for deliver switching district Foundry, by-product in Chicago switch	y outside 9.00
Foundry, by-produ	9.75
England, delivered	11.50
Foundry, by-product or Jersey City, d Foundry, by-produc Foundry, by-produc	el'd 9.65 t. Phila. 9.38
land, delivered .	9.75
Foundry, by-produ cinnati, del'd	ct. Cin-

Foundry, Birmingham	\$6.50
Foundry, by-product, St. Louis, f.o.b. ovens	8.00
Foundry, by-product, del'd St. Louis Foundry, from Birmingham,	9.00
f.o.b. cars docks, Pacific	14.75

Coal Per Ne	et Ton
Mine run steam coal, f.o.b.	1
W. Pa. mines\$1.50 to Mine run coking coal, f.o.b.	\$1.75
W. Pa	2.10
mines 2.00 to	2.25
Mine run gas coal, f.o.b. Pa. mines	2.00
Steam slack, f.o.b. W. Pa. mines 1.00 to	1.25
Gas slack, f.o.b. W. Pa. mines 1.20 to	1.45
Fuel Oil	
	_

	Fuel Oil
	Per Gal. f.o.b. Bayonne, N. J.
No. No.	3 distillate
	Per Gal. f.o.b. Baltimore
No. No.	3 distillate

****	-	********	^				-			~		-	
		Per Ga	Z	del	'd	C	h	ice	ıgı	0			
No.	3 5	industrial industrial	1	uel	oi	1							5.00e. 3.77e.
		Per Gal.		1.0.	ъ.	C	le	ve	la	n	đ		
		distillate industrial											6.00c. 5.75c.
		industrial											

REFRACTORIES Fire Clay Brick

	Per 1000	1.o.b. Works
н	igh-heat l	Intermediate
Du	ity Brick	Duty Brick
Pennsylvania	.\$45.00	\$40.00
Maryland	. 45.00	40.00
New Jersey	. 50.00	43.00
Ohio	40.00	35.00
Kentucky	. 45.00	40.00
Missouri	. 45.00	40.00
Illinois	. 45.00	40.00
Ground fire clay, pe		
ton	. 7.00	

5	Silica	Br	ick	
		Per	1000 f.o.b.	Works
Pennsylvania .				\$45.00
Chicago Distric				54.00
Silica cement p	er net	ton		8.00

zham			\$48 ton	.00 to	54.00 50.00 8.00
	Chr	ome	Brick		
				Pag N	of Ton

				Per N	et Ton
Standard outh M	eeting a	and C	hester.	Pa	\$45.00
more. Chester	Plymou	th 3	feeting	and	45.00
	Mag	nesit	Bric	k	

		Per A	let Ton
	f.o.b.	Baltimore and	\$65.00
Chester, Chemically	Pa. bonded,	f.o.b. Baltimore	
	Grain	Magnesite	

	Grain	Magnesite		
			Per N	et Ton
Imported, Chester, Domestic,		Baltimore sacks) Baltimore		\$45.00
	in sacks	hewelah. W		40.00

Warehouse Prices for Steel Products

Cold-fin. flats and sq. 3.55c.

Rounds and hex. 3.55c.
Cold-rolled strip steel 3.19c.
Hot-rolled nnealed sheets (No. 24) 4.06c.
Heavy hot-rolled sheets (3/16 in. 24 to 48 ln. wide) 3.63c.
Galv. sheets (No. 24) 4.70c.
Bands 3.43c.
Hoops 3.43c.
Heavy hot-rolled sheets 3.18c.
Com. wire nalls, base per keg. 3.15c.
Misch wire has neer 100 th (2500

 Boiler tubes:
 Per 100 Ft.

 Lap welded, 2-in.
 \$18.05

 Seamless welded, 2-in.
 99.24

 Charcoal iron, 2-in.
 24.94

 Charcoal iron, 4-in.
 63.65

*Reinforcing bars 2.35a
*Structural shapes 3.00a
*Plates 3.00a
*Hot-roiled sheets, No. 10 3.10a
*Hot-roiled annealed sheets, No. 24 3.50a
*Colavanized sheets, No. 24 4.35a
*Bands 3.20a
*Hoops 3.20a
*Cold-roiled rounds 3.55a
*Cold-roiled squares, hex and flats 3.52a
*Rivets 1.50a
*Rivets 1.50a
*Columnity extras nor all 1.50a
*Columnity extras nor al

PITTSBURGH	Boiler tubes: Per 100 Ft. Lap welded, 2-in	Cold-fin. flats and sq	*Reinforcing bars
Base per Lb.	Lap welded, 2-in		Structural snapes 3.00c.
Plates	Charcoal iron, 2-in 24.94 Charcoal iron, 4-in 63.65	Heavy hot-rolled sheets (3/16 in., 24 to 48 in. wide)	Hot-rolled annealed sheets, No. 24 3.60c.
Reinforcing steel Dars 2.90c.	*No. 28 and lighter, 36 in. wide, 20c. higher per 100 lb.	Galv. sheets (No. 24)	*Bands 3.20c. *Hoops 3.45c
Cold-finished and screw stock: Rounds and hexagons 3.35c.	ligher per 100 to.	Hoons 3,43c.	#Hoops 3.45c. \$Cold-rolled rounds 3.58c. \$Cold-rolled squares, hex. and flats 3.58c.
Rounds and hexagons		Heavy hot-rolled sheets	Rivets 4.40c. Bolts and nuts, per cent off list60 and 18
	ST. LOUIS	lb. lots or under)	*Quantity extras per size apply. †Quan-
Galv. sheets (No. 24), 25 or more	Base per Lb.	(Over 2500 lb.) 3.40	tity extras per thickness apply. Hot-rolled
bundles	Plates and struc. shapes 3.45c. Bars. soft steel (rounds and flats) 3.25c.	BOSTON	base: 1500 lb. to 1999 lb. add 15c. per
square (more than 3/30 ib.)	Bars, soft steel (squares, hexagons, ovals, half ovals and half rounds) 3.40c.	Base per Lb. Beams, channels, angles, tees, zees 3.54c.	0 to 999 lb., add 50c.
Spikes, large	Cold-fin. rounds, shafting, screw stock 3.75c.	H beams and shapes 3.54c.	quantity extras are: 2000 ib. and over, base: 1500 lb. to 1999 lb. add 15e. per 100 lb.; 1000 lb. to 1499 lb., add 30e.; 0 to 999 lb., add 50c.; 225 bundles and over, base. For 1 to 9 bundles add 50c. per 100 lb.; for 10 to 10 lb.; add 20c. add 20c. per 100 lb.; for 10 to 10 lb.; add 20c. add 20c. per 100 lb.; for 10 to 10 lb.; add 20c. add 20c. per 100 lb.; for 10 to 10 lb.; add 20c. add 20c. per 100 lb.; for 10 to 10 lb.; add 20c. add 20c. per 100 lb.; for 10 to 10 lb.; add 20c. per 100 lb.; for 10 to 10 lb.; add 20c. per 100 lb.; for 10 to 10 lb.; add 20c. per 100 lb.; for 10 to 10 lb.; add 20c. per 100 lb.; for 10 to 10 lb.; add 20c. per 100 lb.; for 10 to 10 lb.; add 20c. per 100 lb.; for 10 to 10 lb.; add 20c. per 100 lb.; for 10 to 10 lb.; add 20c. per 100 lb.; for 10 to 10 lb.; add 20c. per 100 lb.; for 10 to 10 lb.; add 20c. per 100 lb.; for 10 to 10 lb.; add 20c. per 100 lb.; for 10 to 10 lb.; add 20c. per 100 lb.; for 10 to 10 lb.; add 20c. per 100 lb.; for 10 to 10 lb.; add 20c. per 100 lb.; for 10 lb.; add 20c. per 100 lb
Machine bolts, 100 count,	stock	Plates—Sheered, tank and univ. mill, 14 in. thick and heavier 3.56c.	24 bundles add 25c. \$Base for 1000 lb. and over. For 50s
65 per cent off list. Carriage belts, 100 count.	Galv. sheets (No. 24)	Floor plates, diamond pattern 5.36c. Bar and bar shapes (mild steel) 3.45c. Bands 3/16 in. thick and	\$Base for 1000 lb. and over. For 500 to 999 lb. add 25c. per 100 lb.; for 800 to 499 lb. add \$1.00; for 0 to 299 lb. add
Nuts, all styles, 100 count,	Black corrug, sheets (No. 24) 4.10c. *Galv. corrug, sheets	No. 12 ga, incl3.65c, to 4.65c. Half rounds, half ovals, ovals and	add \$3.00.
Large rivets, base per 100 lb\$3.50	Boiler rivets		*For orders 4000 lb. to 9999 lb. Add 15c. per 100 lb. for orders 2000
Wire, black, soft ann'l'd, base per 100 lb 2.65c.	Tank rivets, 7/16 in. and smaller 55	Cold-rolled strip steel3.245c.	to 3999 lb.; add 65c. for orders less than 2000 lb.
Wire, galv. soft, base per 100 lb 3.00c. Common wire nails, per keg 2.60c.	Machine and carriage bolts, lag screws, fitting up bolts, bolt ends, plow bolts,		
Cement coated nails, per keg 2.60c.	hot-pressed nuts, square and hexagon, tapped or blank, semi-finished nuts:	hexagons 3.90c. Cold-finished flats 3.90c. Blue annealed sheets, No. 10 ga. 3.65c.	CHATTANOOGA
On plates, structurals, bars, reinforcing	All quantities		Base per Lb.
bars, bands, hoops and blue annealed sheets, base applies to orders of 400 to 9999 lbs.	*No. 26 and lighter take special prices.	ga 4.20c. Galvanized steel sheets, No. 24 ga. 4.90c. Lead coated sheets, No. 24 ga 5.85c.	Mild steel bars 3.36e.
*Delivered in Pittsburgh switching dis- trics.		Prices delivered by truck in metropoli-	Iron bars 3.36c. Reinforcing bars 3.36c. Structural shapes 3.56c.
tries.	PHILADELPHIA	tan Boston, subject to quantity differentials.	Netrocturis 3.56e. Plates 3.56e. Plates 3.56e. Hot-rolled sheets, No. 10 3.56e. Hot-rolled amealed sheets, No. 24 4.18e. Galvanized sheets, No. 24 4.86e.
	Base per Lb.	DETROIT	Hot-rolled annealed sheets, No. 24., 4.18c.
The state of the s	*Plates, %-in, and heavier 2.98c.	Base per Lb.	Steel bands
CHICAGO	*Structural shapes	Soft steel bars 3.09c.	Cold-finished bars 3.98c.
Base per Lb.	bars (except bands)	Soft steel bars	
Plates and structural shapes 3.20c. Soft steel bars, rounds 3.00c.	and deformed	Hot-rolled annealed sheets (No. 24) 3.94c.	MEMPHIS
Soft steel bars, rounds 3.00c. Soft steel bars, squares and hexagens 3.15c. Cold-fin. steel bars:	*Steel bands, No. 12 and 3/16 in.	Hot-roiled sheets (No. 10) 3.14c. Galvanized sheets (No. 24)** 4.72c. Bands 3.39c.	Base per Lb. Mild steel bars
Reunds and hexagons 3.50c. Flats and squares 3.59c.	incl. 3.18c. Spring steel 5.00c. †Hot-rolled anneal. sheets (No. 24) 3.65c.	Hoops	Shapes har size 3.47e
Hot-relled strip 3.30c. Hot-relled annealed sheets (No. 24) 3.85c.	*Hot-rolled anneal, sheets (No. 24) 3.65c. *Galvanized sheets (No. 24) 4.40c. *Hot-rolled annealed sheets (No.	Hoops 3.59c. †Cold-finished bars 3.64c. Cold-rolled strip 3.18c. Hot-rolled alloy steel (S.A.E. 3100	Iron bars
Galv. sheets (No. 24) 4.55c.	*Hot-rolled annealed sheets (No. 10)	Series,	Plates 3.67c. Hot-rolled sheets, No. 10 3.47c. Hot-rolled annealed sheets, No. 24 4.27c. Galvanized sheets, No. 24 4.89c.
Spikes (keg lets) 3.50c.	10) 3.08c. Diam. pat. floor plates, ¼ in 4.95c. Swedish iron bars 6.25c.	Bolts and nuts, in cases,	Galvanized sheets, No. 24 4.80c.
Spikes (keg lats) 3.50c. Track belts (keg lets) 4.65c. Rivets, structural (keg lots) 3.65c.	There prices are subject to quantity dif-	Broken cases70 per cent off	Steel bands 3.72c. Cold-drawn rounds 3.89c. Cold-drawn flats, squares, hexagons 5.89c.
Rivets, beiler (keg lots) 3.75c. Per Cent Off List	ferentials except on reinforcing and Swed- ish iron hars.	Prices delivered by truck in metropolitan	Structural rivets
			TO 11
Carriage bolts	*Rase prices subject to deduction on	Detroit, subject to quantity differentials. *Price applies to 1,000 lb. and over. twith reduction in chemical extras	Structural rivets
Machine boils "70 Carriage boils "70 Lag screws "70 Hot-pressed nuts, sq. tap or	Base prices subject to deduction on orders aggregating 4000 lb. or over.	*Price applies to 1,000 lb. and over. †With reduction in chemical extras. **0.25c. off list for 10 to 25 bundles;	Bolts and nuts, per cent off list 65 Small rivets, per cent off list 50
Rivets, besizer (keg lots)	Base prices subject to deduction on orders aggregating 4000 lb. or over.	*Price applies to 1,000 lb. and over.	Small rivets, per cent of list 50
Hot-pressed nuts, hex. tap or Hot-pressed nuts, hex. tap or blank. *70	Base prices subject to deduction on orders aggregating 4000 lb. or over.	*Price applies to 1,000 lb. and over. †With reduction in chemical extras. **0.25c. off list for 10 to 25 bundles; 0.50c. for 25 bundles and over, Detroit delivery only.	NEW ORLEANS Base per Lb
Hot-pressed nuts, hex. tap or Hot-pressed nuts, hex. tap or blank*70 Hex. head cap screws	Base prices subject to deduction on orders aggregating 4000 lb. or over.	*Price applies to 1,000 lb. and over. fWith reduction in chemical extras. **0.25c. off list for 10 to 25 bundles: 0.50c. for 25 bundles and over. Detroit	NEW ORLEANS Base per Lb Mild steel bars
Hot-pressed nuts, hex. tap or Hot-pressed nuts, hex. tap or blank*70 Hex. head cap screws	*Base prices subject to deduction on orders aggregating 4000 lb. or over. 'For 50 bundles or over. 'For less than 2000 lb. CLEVELAND Base per Lb.	*Price applies to 1.000 lb. and over. tWith reduction in chemical extras. **0.25c. off list for 10 to 25 bundles; 0.50c. for 25 bundles and over, Detroit delivery only. MILWAUKEE Base per Lb. Plates and structural shapes 3.31c.	NEW ORLEANS NEW ORLEANS Base per Lb Mild steel bars 3.35c. Reinforcing bars 3.56c. Structurel shapes 3.56c.
Hot-pressed nuts, hex. tap or blank. *70 Hex. head cap screws	*Base prices subject to deduction on orders aggregating 4000 lb. or over. 1For 50 bundles or over. 2For less than 2000 lb. CLEVELAND Base per Lb. Plates and struc. shapes 331c.	*Price applies to 1.000 lb. and over. 'tWith reduction in chemical extras. **0.25c. off list for 10 to 25 bundles; 0.50c. for 25 bundles and over. Detroit delivery only. MILWAUKEE Base per Lb. Plates and structural shapes	NEW ORLEANS NEW ORLEANS Base per Lb Mild steel bars 3.35c. Reinforcing bars 3.56c. Structurel shapes 3.56c.
Hot-pressed nuts, hex. tap or Hot-pressed nuts, hex tap or blank. *70 Hex. head cap screws	*Base prices subject to deduction on orders aggregating 4000 lb. or over. *TFor 50 bundles or over. **TFor less than 2000 lb.** **CLEVELAND** Base per Lb.* Plates and struc. shapes	*Price applies to 1.000 lb. and over. 'tWith reduction in chemical extras. **0.25c. off list for 10 to 25 bundles; 0.50c. for 25 bundles and over, Detroit delivery only. **MILWAUKEE* Base per Lb. Plates and structural shapes	NEW ORLEANS Base per Lb
Hot-pressed nuts, hex. tap or Hot-pressed nuts, bex. tap or blank. *70 Hex. head cap screws	*Base prices subject to deduction on orders aggregating 4000 lb. or over. *TFor 50 bundles or over. **TFor less than 2000 lb.** **CLEVELAND** Base per Lb.* Plates and struc. shapes	*Price applies to 1.000 lb. and over. 'tWith reduction in chemical extras. **0.25c. off list for 10 to 25 bundles; 0.50c. for 25 bundles and over, Detroit delivery only. **MILWAUKEE* Base per Lb. Plates and structural shapes	NEW ORLEANS Base per Lb
Hot-pressed nuts, hex. tap or Hot-pressed nuts, bex. tap or blank. *70 Hex. head cap screws	*Base prices subject to deduction on orders aggregating 4000 lb. *TFOF 50 bundles or over. *TFOF less than 2000 lb. **CLEVELAND** *Base per Lb. *Plates and struc. shapes 3.31c. *Soft steel bars 3.00c. *Heinforc. steel bars 2.00c. *Cold-finished steel bars 3.50c. *Flat-rolled steel under ½ in 3.36c. *Cold-finished strip 13.00c. *Hot-rolled annealed sheets (No. 24) 3.91c. *Hot-rolled annealed sheets (No. 24) 3.91c.	*Price applies to 1.000 lb. and over. tWith reduction in chemical extras. **0.25c. off list for 10 to 25 bundles; 0.50c. for 25 bundles and over. Detroit delivery only. MILWAUKEE Base per Lb. Plates and structural shapes 3.31c. Soft steel bars, rounds up to 3 ln., flats and fillet angles	NEW ORLEANS Base per Lb
Hot-pressed nuts, hex. tap or Hot-pressed nuts, bex. tap or blank. *70 Hex. head cap screws	*Base prices subject to deduction on orders aggregating 4000 lb. *TFOF 50 bundles or over. *TFOF 10 subject to deduction on orders. *CLEVELAND *Base per Lb. *Plates and struc. shapes 3.31c. *Soft steel bars 3.00c. *Heinforc. steel bars 2.00c. *Cold-finished steel bars 3.50c. *Flat-rolled steel under % in 3.36c. *Cold-finished strip 13.00c. *Hot-rolled annealed sheets (No. 24) 3.41c. *Galvanized sheets (No. 24) 4.61c. *Hot-rolled sheets (No. 10) 3.31c.	*Price applies to 1.000 lb. and over. twith reduction in chemical extras. **0.25c. off list for 10 to 25 bundles; 0.50c. for 25 bundles and over. Detroit delivery only. **MILWAUKEE* Base per Lb. Plates and structural shapes	NEW ORLEANS Base per Lb
Hot-pressed nuts, hex. tap or Hot-pressed nuts, hex. tap or blank. *70 Hex. head cap screws	*Base prices subject to deduction on orders aggregating 4000 lb. or over. **TFOR 50 bundles or over. **TFOR 100 bundles or over. **CLEVELAND** **CLEVELAND** **CLEVELAND** **Base per Lb.** **Plates and struc. shapes	*Price applies to 1.000 lb. and over. tWith reduction in chemical extras. **0.25c. off list for 10 to 25 bundles; 0.50c. for 25 bundles and over. Detroit delivery only. **MILWAUKEE* Base per Lb. Plates and structural shapes	NEW ORLEANS NEW ORLEANS Base per Lb Mild steel bars 3.56c. Reinforcing bars 3.56c. Structural shapes 3.56c. Hot-rolled sheets, No. 10 3.56c. Hot-rolled annealed sheets, No. 24 4.56c. Galvanized sheets, No. 24 4.36c. Steel bands 3.56c. Cold-finished steel bars 4.36c. Roller rivets 4.26c. Roller rivets 4.26c. Common wire nails, base per keg. \$2.50
Hot-pressed nuts, hex. tap or Hot-pressed nuts, hex. tap or blank. *70 Hex. head cap screws	*Base prices subject to deduction on orders aggregating 4000 lb. or over. 1For 50 bundles or over. 2For less than 2000 lb. **CLEVELAND** **CLEVELAND** **Base per Lb.** **Plates and struc. shapes	*Price applies to 1,000 lb. and over. tWith reduction in chemical extras. **0.25c. off list for 10 to 25 bundles; 0,50c. for 25 bundles and over, Detroit delivery only. **MILWAUKEE* Base per Lh. Plates and structural shapes	NEW ORLEANS Base per Lb Mild steel bars 3.56c. Reinforcing bars 3.56c. Structural shapes 3.56c. Hot-rolled sheets, No. 10 3.56c. Hot-rolled annealed sheets, No. 24 4.56c. Galvanized sheets, No. 24 4.36c. Steel bands 3.56c. Cold-finished steel bars 4.36c. Structural rivets 4.36c. Roller rivets 4.36c. Roller rivets 4.36c. Bolls and nuts, per cent off list. 70
Hot-pressed nuts, hex. tap or Hot-pressed nuts, hex. tap or blank. *70 Hex. head cap screws	*Base prices subject to deduction on orders aggregating 4000 lb. *CLEVELAND *CLEVELAND *CLEVELAND *Base per Lb. *Plates and struc. shapes	*Price applies to 1,000 lb. and over. tWith reduction in chemical extras. **0.25c. off list for 10 to 25 bundles; 0,50c. for 25 bundles and over, Detroit delivery only. **MILWAUKEE* Base per Lh. Plates and structural shapes	NEW ORLEANS Base per Lb Mild steel bars 3.36c. Reinforcing bars 3.56c. Structural shapes 3.59c. Hot-rolled sheets, No. 10 3.59c. Hot-rolled annealed sheets, No. 24 4.98c. Galvanized sheets, No. 24 4.98c. Cold-finished steel bars 4.39c. Cold-finished steel bars 4.39c. Roller rivets 4.29c. Common wire nails, base per keg. \$2.90 PACIFIC COAST Base per Lb.
Hot-pressed nuts, hex. tap or Hot-pressed nuts, hex. tap or blank. *70 Hex. head cap screws	*Base prices subject to deduction on orders aggregating 4000 lb. or over. 1For 50 bundles or over. 2For less than 2000 lb. **CLEVELAND** **CLEVELAND** **Base per Lb.** **Plates and struc. shapes	*Price applies to 1.000 lb. and over. tWith reduction in chemical extras. **0.25c. off list for 10 to 25 bundles; 0.50c. for 25 bundles and over. Detroit delivery only. **MILWAUKEE* **Base per Lb. Plates and structural shapes 3.31c. Soft steel bars, rounds up to 3 in flats and fillet angles 3.1c. Soft steel bars, rounds up to 3 in flats and fillet angles 3.1c. Soft steel bars, squares and hexagons 3.2fc. Hot-rolled strip 3.4ic. Hot-rolled strip 3.4ic. Hot-rolled sheets (No. 20) 3.6fc. Cold-finished steel bars 3.6ic. Cold-folled strip 3.36c. Structural rivets (keg lots) 3.86c. Boller rivets, cone head (keg lots) 3.6c. Track apikes (keg lots) 3.7ic. Track bolts (keg lots) 4.8fc. Biack annealed wire 3.15c. Com. wire nails 2.85c. Cement coated nails Per Cent Off List. Per Cent Off List.	NEW ORLEANS Base per Lb Mild steel bars 3.36c. Reinforcing bars 3.56c. Structural shapes 3.56c. Plates 3.56c. Hot-rolled sheets, No. 10 3.56c. Hot-rolled annealed sheets, No. 24 4.56c. Galvanized sheets, No. 24 4.96c. Steel bands 3.86c. Cold-finished steel bars 4.36c. Cold-finished steel bars 4.36c. Roller rivets 4.26c. Roller rivets 4.26c. Roller rivets 4.26c. Bolls and nuts, per cent off list. 70 PACIFIC COAST Base per Lb. San Fran Los
Hot-pressed nuts, hex. tap or Hot-pressed nuts, hex. tap or blank. *70 Hex. head cap screws	*Base prices subject to deduction on orders aggregating 4000 lb. **TFOR 50 bundles or ever.** **TFOR 100 bundles or ever.** **CLEVELAND** **CLEVELAND** **CLEVELAND** **Base per Lb. **Plates and strue. shapes	*Price applies to 1,000 lb. and over. **Vith reduction in chemical extras. **0.25c. off list for 10 to 25 bundles; 0.50c. for 25 bundles and over. Detroit delivery only. **MILWAUKEE* Base per Lh. Plates and structural shapes 3.31c. Soft steel bars, rounds up to 3 in flats and fillet angles 3.1c. Soft steel bars, rounds up to 3 in flats and fillet angles 3.1c. Soft steel bars, squares and hexagons 3.26c. Hot-rolled strip 3.4ic. Hot-rolled strip 3.4ic. Hot-rolled sheets (No. 10) 3.16c. Galvanized sheets (No. 20) 4.66c. Cold-finished steel bars 3.6ic. Cold-rolled strip 3.3ic. Structural rivets (kee lots) 3.86c. Boller rivets, cone head (keg lots) 3.6c. Track apikes (keg lots) 3.7ic. Track bolts (keg lots) 4.86c. Black annealed wire 3.15c. Com. wire nails 2.85c. Cement coated nails 2.85c. Per Cent Off List Machine bolts 70 and 10	NEW ORLEANS Base per Lb Mild steel bars 3.36c. Reinforcing bars 3.56c. Structural shapes 3.59c. Hot-rolled sheets, No. 10 3.59c. Hot-rolled annealed sheets, No. 24 4.98c. Galvanized sheets, No. 24 4.98c. Cold-finished steel bars 4.39c. Cold-finished steel bars 4.39c. Roller rivets 4.29c. Common wire nalls, base per keg. \$2.90 PACIFIC COAST Base per Lb. San Fran Los cisco Angeles Seattle
Hot-pressed nuts, hex. tap or Hot-pressed nuts, hex. tap or blank. *70 Hex. head cap screws	*Base prices subject to deduction on orders aggregating 4000 lb. **TFOR 50 bundles or ever.** **TFOR 100 bundles or ever.** **CLEVELAND** **CLEVELAND** **CLEVELAND** **Base per Lb. **Plates and strue. shapes	*Price applies to 1.000 lb. and over. tWith reduction in chemical extras. **0.25c. off list for 10 to 25 bundles; 0.50c. for 25 bundles and over, Detroit delivery only. **MILWAUKEE* Base per Lb. Plates and structural shapes 3.31c. Soft ateel bars, rounds up to 8 in. flats and fillet angles 3.11c. Soft ateel bars, rounds up to 8 in. flats and fillet angles 3.14c. Hot-rolled strip 3.41c. Hot-rolled strip 3.41c. Hot-rolled sheets (No. 20) 4.6c. Galvanized sheets (No. 20) 4.6c. Cold-finished steel bars 3.61c. Cold-finished steel bars 3.61c. Cold-finished steel bars 3.61c. Structural rivets, cone head (keg lots) 3.96c. Boiler rivets, cone head (keg lots) 3.96c. Boiler rivets, cone head (keg lots) 3.71c. Track boits (keg lots) 3.71c. Track boits (keg lots) 3.71c. Track boits (keg lots) 3.71c. Com. wire nails 2.85c. Cement coated nails 2.85c. Cement coated nails 2.85c. Per Cent Off List Machine boits 70 and 10	NEW ORLEANS NEW ORLEANS Base per Lb Mild steel bars 3.36c. Reinforcing bars 2.56c. Structural shapes 3.56c. Plates 3.56c. Hot-rolled sheets, No. 10 .24 .4.56c. Galranized sheets, No. 24 .4.56c. Cold-finished steel bars 4.36c. Structural rivets 4.36c. Roller rivets 4.36c. Roller rivets 4.36c. Roller sheets, No. 24 .56c. Roller sheets, No. 24 .4.56c. Roller rivets 4.36c. Roller rivets 5.36c. Roller rivets 5.36c. Roller rivets 6.36c. Roller Rolle
Hot-pressed nuts, hex. tap or Hot-pressed nuts, hex. tap or blank. *70 Hex. head cap screws	*Base prices subject to deduction on orders aggregating 4000 lb. or over. 1For 50 bundles or over. 2For less than 2000 lb. CLEVELAND Base per Lb. Plates and struc. shapes	*Price applies to 1,000 lb. and over. twith reduction in chemical extras. **0.25c. off list for 10 to 25 bundles; 0,50c. for 25 bundles and over. Detroit delivery only. **MILWAUKEE* Base per Lh. Plates and structural shapes. 3.31c. Soft steel bars, rounds up to 8 ln., flats and fillet angles. 3.11c. Soft steel bars, rounds up to 8 ln., flats and fillet angles. 3.11c. Soft steel bars, squares and hexagons 3.26c. Hot-rolled strip. 3.41c. Hot-rolled strip. 3.41c. Hot-rolled sheets (No. 10) 3.16c. Hot-rolled sheets (No. 10) 4.66c. Cold-finished steel bars 3.61c. Cold-rolled strip. 3.33c. Structural rivets (kee lots) 3.86c. Boller rivets, cone head (keg lots) 3.86c. Track spikes (keg lots) 3.71c. Track bolts (keg lots) 4.86c. Black annealed wire 3.15c. Com. wire nails 2.85c. Cement coated nails 2.85c. Cement coated nails 70 and 10 Hot-pressed nuts, sq. and hex tapped or blank (keg lots) 70 and 10 Prices given above are delivered Mil-	NEW ORLEANS Base per Lb Mild steel bars 3.35c. Reinforcing bars 3.55c. Structural shapes 3.55c. Plates 3.55c. Hot-rolled sheets, No. 10 3.55c. Hot-rolled annealed sheets, No. 24 4.56c. Galvanized sheets, No. 24 4.56c. Cold-finished steel bars 4.36c. Cold-finished steel bars 5.25c. Boiler rivets 4.35c. Common wire mails, base per keg. 52.95. Boils and nuts, per cent off list, 76 PACIFIC COAST Base per Lb. San Fran Los clace Angeles Seattle Plates, tank and U. M. 3.25c. 3.60c. 3.55c. Shapes, standard 3.25c. 3.60c. 3.55c. Shapes, standard 3.25c. 3.60c. 3.55c. Shapes, standard 3.25c. 3.60c. 3.55c.
Hot-pressed nuts, hex. tap or Hot-pressed nuts, hex. tap or blank. *70 Hex. head cap screws	*Base prices subject to deduction on orders aggregating 4000 lb. **TFOR 50 bundles or ever.* **TFOR 10 bundles or ever.* **CLEVELAND **CLEVELAND **Base per Lb.* **Plates and struc. shapes 3.31c. Soft steel bars 3.00c. Reinforc. steel bars 2.10c. Reinforc. steel bars 3.50c. Flat-roiled steel bars 3.50c. Flat-roiled steel under % in 3.50c. Cold-finished steel bars 7.3.00c. Hot-roiled annealed sheets (No. 24) 3.91c. Hot-roiled annealed sheets (No. 24) 3.91c. Hot-roiled sheets (No. 24) 4.61c. Hot-roiled sheets (No. 24) 4.61c. Hot-roiled sheets (No. 24) 4.61c. Hot-roiled sheets (No. 24) 5.50c. Sheets 8.50c. Soft sheets 9.240 10. 10. 2.80	*Price applies to 1.000 lb. and over. twith reduction in chemical extras. **0.25c. off list for 10 to 25 bundles; 0.50c. for 25 bundles and over, Detroit delivery only. **MILWAUKEE* **Base per Lb. **Plates and structural shapes	NEW ORLEANS Base per Lb
Hot-pressed nuts, hex. tap or Hot-pressed nuts, hex. tap or blank. *70 Hex. head cap screws	*Base prices subject to deduction on orders aggregating 4000 lb. *CLEVELAND *CLEVELAND *CLEVELAND *Base per Lb. *Plates and struc. shapes 3.3ic. Soft steel bars 3.00c. *Reinforc. steel tars 2.10c. *Cold-finished steel bars 3.50c. *Flat-rolled steel under % in. 3.35c. *Cold-finished steel bars 3.50c. *Flat-rolled steel under % in. 3.35c. *Cold-finished steel bars 3.50c. *Flat-rolled sheets (No. 24) 3.9ic. *Galvanized sheets (No. 24) 3.9ic. *Galvanized sheets (No. 24) 3.1c. *Hot-rolled sheets (No. 24) 3.1c. *Hot-rolled sheets (No. 24) 3.5c. *Hot-rolled sheets (No. 24) 3.5c. *To sheets 3.5c. *So. 9 galv. wire, per 100 lb. 3.2.45 *No. 9 galv. wire, per 100 lb. 2.80 *Com. wire nails, base per keg 2.40 *Toutside delivery 10c. less. *For 5000 lb. er less. *CINCINNATI *Base per Lb. *Plates and struc. shapes 3.32c. *Bars. rounds. flats and angles 3.32c. *Bars. rounds. flats and angles 3.32c.	*Price applies to 1,000 lb. and over. Twith reduction in chemical extras. **0.25c. off list for 10 to 25 bundles; 0.50c. for 25 bundles and over. Detroit delivery only. **MILWAUKEE* **Base per Lh. Plates and structural shapes. 3.31c. Soft ateel bars, rounds up to 3 in flats and fillet angles 3.11c. Soft ateel bars, rounds up to 3 in flats and fillet angles 3.14c. Hot-rolled strip 3.41c. Hot-rolled strip 3.41c. Hot-rolled sheets (No. 10) 3.46c. Hot-rolled sheets (No. 20) 4.66c. Cold-finished steel bars 3.61c. Cold-folled strip 3.36c. Cold-folled strip 3.86c. Boller rivets, cone head (keg lots) 3.6c. Track apikes (keg lots) 3.71c. Track bolts (keg lots) 3.71c. Track polts 4.86c. Black annealed wire 3.15c. Com. wire nails 2.85c. Cement coated nails 2.85c. Machine bolts 70 and 10 Hot-pressed nuts, sq. and hex, tapped or blank (keg lots) 70 and 10 Prices given above are delivered Milwaukee. On plates, shapes, bars, hot-rolled strip and heavy hot-rolled sheets, the base applies on orders of 400 to 9999 lb. On gal-	NEW ORLEANS Base per Lb
Hot-pressed nuts, hex. tap or Hot-pressed nuts, hex. tap or blank. *70 Hex. head cap screws	*Base prices subject to deduction on orders aggregating 4000 lb. *CLEVELAND *CLEVELAND *CLEVELAND *CLEVELAND *Base per Lb. *Plates and struc. shapes 3.3ic. *Soft steel bars 3.00c. *Reinforc. steel bars 2.10c. **Cold-finished steel bars 3.56c. *Cold-finished steel bars 3.00c. *Flat-rolled sheets (No. 24) 3.9ic. *Galvanized sheets (No. 24) 4.6ic. *Hot-rolled sheets (No. 24) 4.6ic. *Hot-rolled sheets (No. 10) 3.1ic. **Hot-rolled sheets (No. 10) 3.1ic. **Hot-rolled sheets (No. 24) 4.6ic. **Soft steel bars 3.56c. **Colm. wire, per 100 lb. \$2.45 **No. 9 galv. wire, per 100 lb. \$2.45 **No. 9 galv. wire, per 100 lb. \$2.45 **Colm. wire nails, base per keg 2.40 **Toutside delivery 10c. less. **For 5000 lb. er less. **For 5000 lb. er less. **CLINCINNATI **Base per Lb. **Plates and struc. shapes 3.42c. **Call steel reinforc. bars 3.37c. **Ball steel reinforc. bars 3.37c. **Ball steel reinforc. bars 3.37c.	*Price applies to 1,000 lb. and over. twith reduction in chemical extras. **0.25c. off list for 10 to 25 bundles; 0.50c. for 25 bundles and over. Detroit delivery only. **MILWAUKEE* Base per Lh. Plates and structural shapes 3.31c. Soft ateel bars, rounds up to 3 in. flats and fillet angles 3.11c. Soft steel bars, rounds up to 3 in. flats and fillet angles 3.1c. Hot-rolled strip 3.4c. Hot-rolled strip 3.4c. Hot-rolled sheets (No. 10) 3.16c. Hot-rolled sheets (No. 10) 3.6c. Cold-finished steel bars 3.6lc. Cold-finished steel bars 3.6lc. Cold-folled strip 3.86c. Boller rivets, cone head (keg lots) 3.6c. Track apikes (keg lots) 3.7lc. Track bolts (keg lots) 3.7lc. Track bolts (keg lots) 3.7lc. Track bolts (keg lots) 3.7lc. Track poltes (keg lots) 3.8c. Black annealed wire 3.15c. Com. wire nails 2.85c. Cement coated nails 2.85c. Cement coated nails 70 and 10 Hot-pressed nuts, sq. and hex, tapped or blank (keg lots) 70 and 10 Prices given above are delivered Milwaukee. On plates, shapes, bars, hot-rolled strip and heavy hot-rolled sheets, the base applies on orders of 400 to 9999 lb. On galvanized and No. 24 hot-rolled annealed sheets the prices given apply on orders of	NEW ORLEANS Base per Lb
Hot-pressed nuts, hex. tap or Hot-pressed nuts, hex. tap or blank. *70 Hex. head cap screws	*Base prices subject to deduction on orders aggregating 4000 lb. **TFOR 50 bundles or ever.** **TFOR less than 2000 lb.** **CLEVELAND** **CLEVELAND** **CLEVELAND** **Base per Lb.** **Plates and struc. shapes 3.31c. Soft steel bars 3.00c. Reinforc. steel tars 2.10c. Reinforc. steel tars 2.10c. Told-finished steel bars 3.50c. Flat-rolled steel under 4 in 3.35c. Flat-rolled steel under 4 in 3.35c. Roll-finished strip 73.00c. Hot-rolled annealed sheets (No. 24) 3.91c. Hot-rolled sheets (No. 24) 3.91c. Hot-rolled sheets (No. 24) 4.61c. Hot-rolled sheets (No. 24) 4.61c. Hot-rolled sheets (No. 24) 4.5c. Hot-rolled sheets (No. 24) 4.5c. Who. 9 galv. wire, per 100 lb. 3.245 *No. 9 galv. wire, per 100 lb. 2.80 *Com. wire nails, base per keg 2.40 *TOutside delivery 10c. less. *For 5000 lb. er less. ** **CLINCINNATI** **Plates and struc. shapes 3.42c. Other shapes 3.37c. Hoops and bands, 3/16 in. and 3/47c.	*Price applies to 1.000 lb. and over. twith reduction in chemical extras. **0.25c. off list for 10 to 25 bundles; 0.50c. for 25 bundles and over, Detroit delivery only. **MILWAUKEE* **Base per Lb.* *Plates and structural shapes	NEW ORLEANS Base per Lb
Hot-pressed nuts, hex. tap or Hot-pressed nuts, hex. tap or blank. *70 Hex. head cap screws	*Base prices subject to deduction on orders aggregating 4000 lb. *CLEVELAND *CLEVELAND *CLEVELAND *CLEVELAND *Base per Lb. *Plates and struc. shapes 3.31c. *Soft steel bars 3.00c. *Reinforc. steel bars 2.10c. **Cold-finished steel bars 3.50c. *Flat-roiled steel under '\(\) in 3.35c. *Cold-finished strip 73.00c. *Hot-roiled strip 8.3.36c. *Cold-finished strip 8.3.36c. *Cold-finished strip 8.3.36c. *Cold-finished strip 8.3.36c. **Cold-finished strip 8.3.36c. **Cold-finished strip 8.3.36c. **Cold-finished strip 9.3.3.1c. **Hot-roiled sheets (No. 24) 4.61c. **Hot-roiled sheets (No. 24) 4.61c. **Hot-roiled sheets (No. 24) 1.5c. **So. 9 galv. wire, per 100 lb \$.2.45 **No. 9 galv. wire, per 100 lb \$.2.40 **Colm. wire nails, base per keg 2.40 **Toutside delivery 10c. less. **For 5000 lb. er less. **For 5000 lb. er less. **Coll-finished struc. shapes 3.37c. **Bail steel reinforc. bars 3.37c. **Bail steel reinforc. bars 3.35c. **Hoops and bands, 3/16 in, and lighter 3.47c. **Cold-finished bars 1.72c. **Yout 1.72c. **Cold-finished bars 1.72c. **Tout 1.72c. **Tout 1.72c. **Cold-finished bars 1.72c. **Tout 1.72c. **T	*Price applies to 1.000 lb. and over. twith reduction in chemical extras. **0.25c. off list for 10 to 25 bundles; 0.50c. for 25 bundles and over. Detroit delivery only. **MILWAUKEE* **Base per Lb.* *Plates and structural shapes 3.31c. **Soft ateel bars, rounds up to 8 in flats and fillet angles 3.1c. **Soft ateel bars, rounds up to 8 in flats and fillet angles 3.1c. **Soft ateel bars, squares and hexagons 3.26c. Hot-roiled strip 3.41c. Hot-roiled strip 3.41c. Hot-roiled sheets (No. 10) 3.16c. Cold-finished steel bars 3.61c. Cold-roiled strip 3.86c. Structural rivets (keg lots) 3.86c. Boiler rivets, cone head (keg lots) 3.86c. Black annealed wire 3.71c. Track boils (keg lots) 3.70 and 10 Carriage boils 70 and 10 Carriage boils 70 and 10 Prices given above are delivered Milwaukee. On plates, shapes, bars, hot-roiled strip and heavy hot-roiled sheets, the base applies on orders of 400 to 9999 lb. On galvanized and No. 24 hot-roiled annealed sheets the prices given apply on orders of 400 to 9999 lb. On galvanized and No. 24 hot-roiled annealed sheets the prices given apply on orders of 400 to 9999 lb. On galvanized and No. 24 hot-roiled annealed sheets the prices given apply on orders of 400 to 9999 lb. On galvanized and No. 24 hot-roiled annealed sheets the prices given apply on orders of 400 to 9999 lb. On galvanized and No. 24 hot-roiled annealed sheets the prices given apply on orders of 400 to 9999 lb. On galvanized and No. 24 hot-roiled annealed sheets the prices given apply on orders of 400 to 9999 lb. On galvanized and No. 24 hot-roiled sheets the prices given apply on orders of 400 to 9999 lb. On galvanized and No. 24 hot-roiled sheets the prices given apply on orders of 400 to 9999 lb. On galvanized and No. 24 hot-roiled s	NEW ORLEANS Base per Lb
Hot-pressed nuts, hex. tap or Hot-pressed nuts, hex. tap or blank. *70 Hex. head cap screws	*Base prices subject to deduction on orders aggregating 4000 lb. *CLEVELAND *CLEVELAND *CLEVELAND *CLEVELAND *Base per Lb. *Plates and struc. shapes 3.31c. *Soft steel bars 3.00c. *Reinforc. steel bars 2.10c. **Cold-finished steel bars 3.56c. *Cold-finished strip 4.0. 3.36c. *Cold-finished strip 73.00c. *Hot-roiled sheets (No. 24) 4.61c. *Hot-roiled sheets (No. 10) 3.11c. *Hot-roiled sheets (No. 10) 3.11c. *Hot-roiled sheets (No. 10) 2.2.80 **Com. where anils base per keg 2.40 **Toutside delivery 10c. less. **For 5000 lb. er less. **For 5000 lb. er less. **Cold-finished struc. shapes 3.37c. *Rail steel reinforc. bars 3.37c. *Rail steel reinforc. bars 3.37c. *Rail steel reinforc. bars 3.37c. **Hoops and bands, 3/16 in. and lighter 3.47c. **Cold-finished bars 3.72c. **Hot-roiled annealed sheets (No. 24) 4.72c. **Cold-finished bars 3.72c. **Hot-roiled annealed sheets (No. 24) 4.72c. **Cold-finished bars 3.72c. **Hot-roiled annealed sheets (No. 24) 4.72c. **Cold-finished bars 4.72c. **Hot-roiled annealed sheets (No. 24) 4.72c. **Cold-finished bars 4.72c. **Hot-roiled annealed sheets (No. 24) 4.72c.	*Price applies to 1,000 lb. and over. twith reduction in chemical extras. **0.25c. off list for 10 to 25 bundles; 0,50c. for 25 bundles and over, Detroit delivery only. **MILWAUKEE Base per Lh. Plates and structural shapes	NEW ORLEANS Base per Lb
Hot-pressed nuts, hex. tap or Hot-pressed nuts, hex. tap or blank. *70 Hex. head cap screws	*Base prices subject to deduction on orders aggregating 4000 lb. *CLEVELAND *CLEVELAND *CLEVELAND *CLEVELAND *Base per Lb. *Plates and struc. shapes 3.31c. *Soft steel bars 3.00c. *Reinforc. steel bars 2.10c. *Cold-finished steel bars 3.56c. *Cold-finished strip 4.0. 3.36c. *Cold-finished strip 73.00c. *Hot-rolled snealed sheets (No. 24) 3.91c. *Hot-rolled snealed sheets (No. 24) 4.61c. *Hot-rolled snealed sheets (No. 24) 4.61c. *Hot-rolled sheets (No. 10) 3.11c. *Soft steel bars 3.56c. *Cold-finished strip 4.61c. *Galvanized sheets (No. 24) 4.61c. *Hot-rolled sheets (No. 24) 4.61c. *Hot-rolled sheets (No. 24) 5.5c. *So. 9 galv. wire, per 100 lb. \$2.45 *No. 9 galv. wire, per 100 lb. \$2.45 *No. 9 galv. wire, per 100 lb. \$2.40 *Colm. wire nails, base per keg 2.40 *Toutside delivery 10c. less. *For 5000 lb. or less. **For 5000 lb. or less. **Cold-finished bars 3.37c. *Rail steel reinfore, bars 3.37c. *Hoops and bands, 3/16 in. and lighter 3.47c. *Cold-finished bars 3.72c. *Hot-rolled annealed sheets (No. 24) 4.72c. *Cold-finished bars 1.72c. *Cold-finished sheets (No. 24) 4.72c. *Cold-finished sheets (No	*Price applies to 1,000 lb. and over. TWith reduction in chemical extras. **0.25c. off list for 10 to 25 bundles; 0,50c. for 25 bundles and over, Detroit delivery only. **MILWAUKEE Base per Lh. Plates and structural shapes. 3.31c. Soft steel bars, rounds up to 8 ln., flats and fillet angles. 3.11c. Soft steel bars, rounds up to 8 ln., flats and fillet angles. 3.11c. Soft steel bars, squares and hexagons 3.26c. Hot-rolled strip. 3.41c. Hot-rolled strip. 3.41c. Hot-rolled sheets (No. 10) 3.16c. Hot-rolled sheets (No. 20) 4.66c. Cold-finished steel bars 3.61c. Cold-rolled strip. 3.35c. Structural rivets (kee lots) 3.38c. Track spikes (kee lots) 3.71c. Track bolts (kee lots) 3.71c. Track spikes (kee lots) 4.86c. Black annealed wire 3.15c. Com. wire nails 2.85c. Cement coated nails 2.85c. Cement coated nails 2.85c. Machine bolts 70 and 10 Hot-pressed nuts, sq. and hex tapped or blank (keg lots) 70 and 10 Prices given above are delivered Milwaukee. On plates, shapes, bars, hot-rolled strip and heavy hot-rolled sheets, the base applies on orders of 400 to 9999 lb. On galvanized and No. 24 hot-rolled sarneales heets the prices given apply on orders of 400 to 1500 lb. On cold-finished bars the prices given papiny on orders of 400 to 1999 no orders of 400 to 1500 lb. On cold-finished bars the prices are for orders of 400 to 1999 no orders of 400 to 1990 lb. On more	NEW ORLEANS Base per Lb
Hot-pressed nuts, hex. tap or Hot-pressed nuts, hex. tap or blank. *70 Hex. head cap screws	*Base prices subject to deduction on orders aggregating 4000 lb. **TFOR 50 bundles or ever.** **IFOR less than 2000 lb.** **CLEVELAND** **CLEVELAND** **Base per Lb.** **Plates and struc. shapes 3.3ic.* **Soft steel bars 3.00c.* **Reinforc. steel tars 3.00c.* **Reinforc. steel tars 3.50c.* **For 101d-finished steel bars 3.50c.* **Fiat-roiled steel under % in. 3.35c.* **For 101d-finished strip 1.00c.* **Shack ann'i'd wire, per 100 lb. \$2.45.* **No. 9 galv. wire, per 100 lb. \$2.80.* **Com. wire nails, base per keg 2.40.* **TOutside delivery 10c. less.* **For 5000 lb. er less.* **For 5000 lb. er less.* **For 5000 lb. er less.* **Cold-finished strip 1.00c.* **Cold-finished bars 3.25c.* **Hoops and bands, 3/16 in. and 1 lighter 1.00c.* **Cold-finished bars 1.00c.* **Cold-finished bars 1.00c.* **Hoops and bands, 3/16 in. and 1 lighter 1.00c.* **Cold-finished bars 1.00c.* **Hoops and bands, 3/16 in. and 1 lighter 1.00c.* **Cold-finished bars 1.00c.* **Hoops and bands, 3/16 in. and 1 lighter 1.00c.* **Cold-finished bars 1.00c.* **Hoops and bands, 3/16 in. and 1 lighter 1.00c.* **Cold-finished bars 1.00c.* **Hoops and bands, 3/16 in. and 1 lighter 1.00c.* **Cold-finished bars 1.00c.* **Cold-finished bars 1.00c.* **Hoops and bands, 3/16 in. and 1 lighter 1.00c.* **Cold-finished bars 1.00c.* **Cold-finished b	*Price applies to 1.000 lb. and over. twith reduction in chemical extras. **0.25c. off list for 10 to 25 bundles; 0.50c. for 25 bundles and over, Detroit delivery only. **MILWAUKEE Base per Lh. Plates and structural shapes	NEW ORLEANS Base per Lb
Hot-pressed nuts, hex. tap or Hot-pressed nuts, hex. tap or blank. *70 Hex. head cap screws	*Base prices subject to deduction on orders aggregating 4000 lb. *CLEVELAND *CLEVELAND **CLEVELAND **CLEVELAND **Base per Lb.** **Plates and struc. shapes	*Price applies to 1,000 lb. and over. twith reduction in chemical extras. **0.25c. off list for 10 to 25 bundles; 0,50c. for 25 bundles and over. Detroit delivery only. **MILWAUKEE* Base per Lh. Plates and structural shapes 3.31c. Soft ateel bars, rounds up to 3 in flats and fillet angles 3.11c. Soft steel bars, rounds up to 3 in flats and fillet angles 3.14c. Hot-rolled strip 3.41c. Hot-rolled strip 3.41c. Hot-rolled sheets (No. 10) 3.46c. Hot-rolled sheets (No. 10) 3.66c. Cold-finished steel bars 3.61c. Cold-folled strip 3.86c. Boller rivets, cone head (keg lots) 3.6c. Track apikes (keg lots) 3.71c. Track bolts (keg lots) 3.71c. Track bolts (keg lots) 3.71c. Track polts (keg lots) 70 and 10 Hot-pressed nuts, sq. and hex. tanped or blank (keg lots) 70 and 10 Hot-pressed nuts, sq. and hex. tanped or blank (keg lots) 70 and 10 Prices given above are delivered Mil- waukee. On plates, shapes, bars, hot-rolled strip and heavy hot-rolled sheets, the base ap- plies on orders of 400 to 9999 lb. On gal- vanized and No. 24 hot-rolled annealed sheets the prices given apply on orders of 400 to 1500 lb. Or cold-finished bars the prices are for orders of 1000 lb. or more of a size. ST. PAUL Base per Lb. Mild steel bars, rounds 3.25c. Structural shapes 3.45c.	NEW ORLEANS Base per Lb
Hot-pressed nuts, hex. tap or Hot-pressed nuts, hex. tap or blank. *70 Hex. head cap screws	*Base prices subject to deduction on orders aggregating 4000 lb. *CLEVELAND *CLEVELAND *CLEVELAND *Base per Lb. *Plates and struc. shapes	*Price applies to 1.000 lb. and over. twith reduction in chemical extras. **0.25c. off list for 10 to 25 bundles; 0.50c. for 25 bundles and over. Detroit delivery only. **MILWAUKEE* **Base per Lh. Plates and structural shapes 3.31c. Soft steel bars, rounds up to 3 in flats and fillet angles 3.1c. Soft steel bars, rounds up to 3 in flats and fillet angles 3.1c. Soft steel bars, squares and hexagons 3.26c. Hot-rolled strip 3.4ic. Hot-rolled strip 3.4ic. Hot-rolled sheets (No. 10) 3.16c. Cold-floid sheets (No. 20) 4.66c. Cold-floid sheets (No. 20) 4.66c. Cold-floid strip 3.35c. Cold-floid strip 3.36c. Cold-floid strip 3.36c. Cold-floid strip 3.37c. Track spikes (keg lots) 3.86c. Boller rivets, cone head (keg lots) 3.6c. Com. wire nails 2.85c. Cement coated nails 2.85c. Cement coated nails 2.85c. Cement coated nails 70 and 10 Hot-pressed nuts, sq. and hex. tapped or blank (keg lots) 70 and 10 Hot-pressed nuts, sq. and hex. tapped or blank (keg lots) 70 and 10 Prices given above are delivered Milwaukee. On plates, shapes, bars, hot-rolled strip and heavy hot-rolled sheets, the base applies on orders of 400 to 9999 lb. On galvanized and No. 24 hot-rolled annealed sheets the prices given apply on orders of 400 to 1999 lb. On cold-finished bars the prices are for orders of 1000 lb. or more of a size. **ST. PAUL** Base per Lb. Mild steel bars. rounds 3.25c. Clates and the services 4.5c.	NEW ORLEANS Base per Lb
Hot-pressed nuts, hex. tap or Hot-pressed nuts, hex. tap or blank. *70 Hex. head cap screws	*Base prices subject to deduction on orders aggregating 4000 lb. *TFOF 50 bundles or ever. *TFOF 16 sundles or ever. *TFOF 16 sundles or ever. *TFOF 16 sundles or ever. **CLEVELAND **Base per Lb. **Plates and struc. shapes 3.3ic. **Soft steel bars 3.00c. **Reinforc. steel bars 3.00c. **Reinforc. steel bars 2.00c. **Cold-finished steel bars 3.50c. **Flat-rolled sheets (No. 24) 4.61c. **Hot-rolled sheets (No. 24) 4.61c. **Hot-rolled sheets (No. 24) 3.56c. **Black ann'I'd wire, per 100 lb. \$2.45 **No. 9 galv. wire, per 100 lb. \$2.45 **Com. wire nails, base per keg 2.40 **TOutside delivery 10c. less. **For 5000 lb. er less. **For 5000 lb. er less. **Cold-finished bars 3.72c. **Hoops and bands, 3/16 in. and lighter 3.72c. **Hot-rolled annealed sheets (No. 24) 4.72c. **Hot-rolled annealed sheets (No. 24) 4.72c. **Hot-rolled annealed sheets (No. 24) 4.72c. **Hot-rolled sheets (No. 10) 3.12c. **Sold-finished bars 3.72c. **Hot-rolled sheets (No. 10) 3.2c. **Small rivets (No. 24) 4.72c. **Hot-rolled sheets (No. 10) 3.2c. **Small rivets (No. 24) 4.72c. **Small rivets (No. 10) 3.2c. **Small rivets (No. 10) 3.2c. **Sold-finished bars 1.55 per cent off lst. **No. 9 ann'I'd wire, per 100 lb. (1000 **lb. or over) \$2.88c. **Com. wire nails, base per keg: 3.56c. **Com	*Price applies to 1.000 lb. and over. twith reduction in chemical extras. **0.25c. off list for 10 to 25 bundles; 0.50c. for 25 bundles and over. Detroit delivery only. **MILWAUKEE* **Base per Lh. Plates and structural shapes 3.31c. Soft steel bars, rounds up to 3 in flats and fillet angles 3.1c. Soft steel bars, rounds up to 3 in flats and fillet angles 3.1c. Soft steel bars, squares and hexagons 3.26c. Hot-rolled strip 3.4ic. Hot-rolled strip 3.4ic. Hot-rolled sheets (No. 10) 3.16c. Cold-floid sheets (No. 20) 4.66c. Cold-floid sheets (No. 20) 4.66c. Cold-floid strip 3.35c. Cold-floid strip 3.36c. Cold-floid strip 3.36c. Cold-floid strip 3.37c. Track spikes (keg lots) 3.86c. Boller rivets, cone head (keg lots) 3.6c. Com. wire nails 2.85c. Cement coated nails 2.85c. Cement coated nails 2.85c. Cement coated nails 70 and 10 Hot-pressed nuts, sq. and hex. tapped or blank (keg lots) 70 and 10 Hot-pressed nuts, sq. and hex. tapped or blank (keg lots) 70 and 10 Prices given above are delivered Milwaukee. On plates, shapes, bars, hot-rolled strip and heavy hot-rolled sheets, the base applies on orders of 400 to 9999 lb. On galvanized and No. 24 hot-rolled annealed sheets the prices given apply on orders of 400 to 1999 lb. On cold-finished bars the prices are for orders of 1000 lb. or more of a size. **ST. PAUL** Base per Lb. Mild steel bars. rounds 3.25c. Clates and the services 4.5c.	NEW ORLEANS Base per Lb
Hot-pressed nuts, hex. tap or Hot-pressed nuts, hex. tap or blank. *70 Hex. head cap screws	*Base prices subject to deduction on orders aggregating 4000 lb. *CLEVELAND *CLEVELAND **Base per Lb.** *CLEVELAND **Base per Lb.** **Plates and struc. shapes	*Price applies to 1,000 lb. and over. twith reduction in chemical extras. **0.25c. off list for 10 to 25 bundles; 0,50c. for 25 bundles and over, Detroit delivery only. **MILWAUKEE* Base per Lh. Plates and structural shapes	NEW ORLEANS Base per lb
Hot-pressed nuts, hex. tap or Hot-pressed nuts, hex. tap or blank. *70 Hex. head cap screws	*Base prices subject to deduction on orders aggregating 4000 lb. **CLEVELAND** **CLEVELAND** **CLEVELAND** **CLEVELAND** **CLEVELAND** **CLEVELAND** **CLEVELAND** **Base per Lb.** **Plates and struc. shapes 3.31c. Soft steel bars 3.00c. Reinforc. steel bars 3.00c. Reinforc. steel bars 2.10c. Cold-finished steel bars 3.50c. Flat-rolled steel under '& in. 3.36c. Cold-finished strip 73.00c. Hot-rolled steels (No. 24) 3.91c. Galvanized sheets (No. 24) 4.61c. Hot-rolled sheets (No. 10) 4.61c. Hot-rolled 3/16 in. 24 to 48 in. wide sheets sheets (No. 10) 1.2.80 '*Com. wire nails, base per keg 2.40 '*TOutside delivery 10c. less.** **For 5000 lb. or less.** **For 5000 lb. or less.** **Cold-finished bars 3.37c. Hali steel reinforc. bars 3.37c. Hali steel reinforc. bars 3.37c. Hali steel reinforc. bars 3.7c. Hoops and bands, 3/16 in. and lighter 3.7c. Hot-rolled annealed sheets (No. 24) 4.7c. Hot-rolled sheets (No. 10) 3.22c. Structural rivets 5.5 per cent off lst No. 9 ann'i'd wire, per 100 lb. (1000 lb. or over) 2.88 Small rivets 5.50 per cent off lst No. 9 ann'i'd wire, per 100 lb. (1000 lb. or over) 2.88 Son Not per 100 lb. 8.35 Chain, lin. per 100 lb. 8.35 Not per 100 lb. 8.35 Chain, lin. per 100 lb. 8.35 Not per 100 lb. 8.35 Chain, lin. per 100 lb. 8.35 Not per 1	*Price applies to 1.000 lb. and over. twith reduction in chemical extras. **0.25c. off list for 10 to 25 bundles; 0.50c. for 25 bundles and over, Detroit delivery only. **MILWAUKEE Base per Lh. Plates and structural shapes	NEW ORLEANS Base per Lb Mild steel bars 3.3&. Reinforcing bars 2.5be. Structural shapes 3.5be. Flates 3.5be. Hot-rolled sheets, No. 10 3.5be. Hot-rolled annealed sheets, No. 24 4.5be. Galvanized sheets, No. 24 4.5be. Cold-finished steel bars 4.3be. Cold-finished steel bars 4.2be. Common wire nails, base per keg. 32.95 Boils and nuts, per cent off list. 70 PACIFIC COAST Base per Lb. San Fran Los clso Angeles Seattle Plates. tank and U. M. 3.25c. 3.60c. 3.5be. Shapes, standard 3.25c. 3.60c. 3.7be. Reinforcing bars, 3.25c. 3.60c. 3.7be. Reinforcing bars, 3.25c. 3.60c. 3.7be. Reinforcing bars, 3.25c. 3.60c. 3.7be. Hot-rolled annealed sheets (No. 24) 4.00c. 4.35c. 4.6be. Hot-rolled annealed sheets (No. 24) 4.00c. 4.35c. 4.6be. Hot-rolled sheets (No. 2.5be. 3.7be. Galv. sheets (No. 2.5be. 3.7be. 3.7be. Galv. sheets (No. 2.5c. 3.7be. 3.7be. Galv. sheets (No. 4.5c. 4.95c. 5.0be. Cod finished steel Rounds 5.80c. 5.85c. 5.85c. 6.0be. S q u a r e s and hexagons 7.55c. 7.60c. 8.25c. Common wire nails base per keg less carload \$3.20. \$3.20. \$3.30 All items subject to differentials for
Hot-pressed nuts, hex. tap or Hot-pressed nuts, hex. tap or blank. *70 Hex. head cap screws	*Base prices subject to deduction on orders aggregating 4000 lb. **CLEVELAND** *CLEVELAND** *CLEVELAND** *CLEVELAND** *Base per Lb. *Plates and struc. shapes 3.31c. *Soft steel bars 3.00c. *Reinforc. steel bars 3.50c. *Flat-rolled steel under '4 in 3.36c. *Cold-finished steel bars 3.50c. *Flat-rolled sneelad cheets (No. 24) 3.91c. *Gaivanized sheets (No. 24) 4.61c. *Hot-rolled sheets (No. 10) 4.61c. *Hot-rolled sheets (No. 10) 5.245 *No. 9 galv. wire. per 100 lb. \$2.45 *No. 9 galv. wire. per 100 lb. \$2.80 *Com. wire nails. base per keg 2.40 *TOutside delivery 10c. less. *For 5000 lb. or less. **Cold-finished bars 3.37c. *Bail steel reinforc. bars 3.37c. *Bail steel reinforc. bars 3.25c. *Hoops and bands, 3/16 in. and lighter 3.7c. *Cold-finished bars 1.7c. *Hot-rolled annealed sheets (No. 24) 4.7c. *Hot-rolled annealed sheets (No. 24) 4.7c. *Hot-rolled sheets (No. 10) 3.2c. *Somall rivets 5.5 per cent off lst. *No. 9 ann'i'd wire, per 100 lb. (1000 lb. or over) 2.88 com. wire nails, base per keg. *Com. wire nails, base per keg: Any quantity less than carload. 3.04 cent c't'd nails, base per keg: 3.50 chain, lin, per 100 lb. 8.35 com. Net per 100 lb. 8.35 com. Net per 100 lb. 1.20 chain, lin, per 100 lb. 8.35 com. Net per 100 lb. 1.20 chain, lin, per 100 lb. 8.35 com. Net per 100 lb. 1.20 chain, lin, per 100 lb. 1.20 chain. In, per 100 lb. 2.20 chain. In, per 100 lb. 1.20 chain. In, per 100 lb. 1.20 chain. In, per 100 lb. 2.20 chain.	*Price applies to 1,000 lb. and over. twith reduction in chemical extras. **0.25c. off list for 10 to 25 bundles? 0,50c. for 25 bundles and over, Detroit delivery only. **MILWAUKEE Base per Lh. Plates and structural shapes 3.31c. Soft steel bars, rounds up to 8 ln., flats and fillet angles 3.11c. Soft steel bars, rounds up to 8 ln., flats and fillet angles 3.25c. Hot-roiled strets (No. 20) 3.16c. Hot-roiled strets (No. 20) 4.66c. Cold-dishests (No. 20) 4.66c. Cold-dishest (No. 20) 4.66c. Cold-troiled strets (No. 20) 4.66c. Cold-troiled strip 3.35c. Structural rivets (kee lots) 3.85c. Track spikes (keg lots) 3.71c. Track spikes (keg lots) 3.71c. Track spikes (keg lots) 4.86c. Black annealed wire 3.5c. Com. wire nails 2.85c. Com. wire nails 2.85c. Com. vire nails 70 and 10 Prices given above are delivered Milwauke 70 and 10 Prices given above are delivered Milwauke 70 and 10 Prices given above are delivered Milwauke 70 and 10 Prices given above are delivered Milwauke 70 and 10 Prices given above are delivered Milwauke 70 and 10 Prices given above are delivered Milwauke 70 and 10 Prices given above are delivered Milwauke 70 and 10 Prices given above are delivered Milwauke 70 and 10 Prices given above are delivered Milwauke 70 and 10 On plates, shapes, bars, hot-rolled strin and heavy hot-rolled sheets, the base applies on orders of 400 to 999 lb. On galvanized and No. 24 hot-rolled annealed sheets with prices are for orders of 1000 lb. or more of a size. ST. PAUL Base per Lb. Mild steel bars, rounds 3.25c. Structural shapes 3.5c. Cold-finished bars 4.2c. Finance and bands the base applies on 400 to 15.999 lb. On hot-rolled sheets, palevanized sheets, No. 24 4.9c. Golvanized sheets, No. 24 4.9c. Golvanized sheets, No. 24 4.9c. Golvanized sheets, No. 24	NEW ORLEANS Base per Lb Mild steel bars 3.3&. Reinforcing bars 3.5be. Structural shapes 3.5be. Structural shapes 3.5be. Hot-rolled sheets, No. 10 3.5b. Hot-rolled annealed sheets, No. 24 4.5be. Galvanized sheets, No. 24 4.5be. Cold-finished steel bars 4.3be. Cold-finished steel bars 4.3be. Cold-finished steel bars 4.2be. Roller rivets 4.2be. Common wire nails, base per keg. 52.90 PACIFIC COAST Base per Lb. San Fran- Los clsc Angeles Seattle Plates, tank and U. M. 3.2bc. 3.6bc. 3.5bc. Shapes, standard 3.2bc. 3.6bc. 3.5bc. Shapes, standard 3.2bc. 3.6bc. 3.5bc. Soft steel bars 3.2bc. 3.6bc. 3.5bc. Soft steel bars 3.2bc. 3.6bc. 3.5bc. Soft steel bars 3.2bc. 3.6bc. 3.5bc. Shapes, standard 3.2bc. 3.6bc. 3.5bc. Shapes, standard 3.2bc. 3.6bc. 3.5bc. Shapes, standard 3.2bc. 3.6bc. 3.5bc. Soft steel bars 5.2bc. 3.6bc. 3.5bc. Talt 3.2bc. 3.2bc. 3.6bc. 3.5bc. Hot-rolled annealed 4.5bc. 4.9bc. 5.5bc. Glaiv, sheets (No. 44).0cc. 4.3bc. 4.4bc. Cold finished steel Rounds 7.7bsc. 7.6bc. 3.2bc. Common wire nails —base per keg less carload 5.3.2o. \$3.2o. \$3.3bc. All items subject to differentials for quantity.
Hot-pressed nuts, hex. tap or Hot-pressed nuts, hex. tap or blank. *70 Hex. head cap screws	*Base prices subject to deduction on orders aggregating 4000 lb. *TFOF 50 bundles or ever. *IFOF less than 2000 lb. *CLEVELAND Base per Lb. Plates and struc. shapes	*Price applies to 1.000 lb. and over. twith reduction in chemical extras. **0.25c. off list for 10 to 25 bundles. 0.50c. for 25 bundles and over, Detroit delivery only. **MILWAUKEE* Base per Lh. Plates and structural shapes 3.31c. Soft steel bars, rounds up to 8 lm. flats and fillet angles 3.41c. Hot-roiled strip 3.40c. Hot-roiled strip 3.40c. Hot-roiled strip 3.40c. Hot-roiled stress (No. 20) 3.40c. Hot-roiled stress (No. 20) 3.40c. Cold-finished steel bars 3.41c. Soft steel bars stress (No. 20) 3.61c. Cold-toiled strip 3.33c. Structural rivets (keg lots) 3.86c. Boller rivets, cone head (keg lots) 3.6c. Track spikes (keg lots) 3.86c. Black annealed wire 3.85c. Com. wire nails 2.85c. Com. wire nails 2.85c. Com. wire nails 70 and 10 Prices given above are delivered Milwaukee. On blates, shapes, bars, hot-roiled strip and heavy hot-roiled sheets the base applies on orders of 400 to 1909 lb. On galvanized and No. 24 hot-roiled strip and heavy hot-roiled sheets the base applies on orders of 400 to 1909 lb. On cold-finished bars the prices are for orders of 1000 lb. or more of a size. ST. PAUL Base per Lb. Mild steel bars, rounds 3.25c. Structural shapes 3.45c. Cold-finished bars 3.45c. Cold-finished bars 3.45c. Cold-finished bars shapes, plates and hoops and bands the base applies on 400 to 14,999 lb. On hot-roiled sheets, Ralvanized sheets, No. 24 4.59c. Cold-roiled sheets, No. 20 4.95c. On mild steel bars, shapes, plates and hoops and bands the base applies on 400 to 14,999 lb. On hot-roiled sheets, Ralvanized sheets, No. 20 4.95c. On mild steel bars, shapes, plates and hoops and bands the base applies on 400 to 14,999 lb. On hot-roiled sheets, Ralvanized sheets, No. 20 4.95c. On mild steel bars, shapes, plates and hoops and bands the base applies on 400 to 14,999 lb. On hot-roiled sheets, Ralvanized sheets, No. 20 4.95c. On mild steel bars, shapes, plates and on cold-finished bars the on cold-finished bars t	NEW ORLEANS Base per Lb. Mild steel bars 3.3&. Reinforcing bars 3.5be. Structural shapes 3.5be. Structural shapes 3.5be. Hot-rolled sheets, No. 10 3.5be. Hot-rolled annealed sheets, No. 24 4.5be. Galvanized sheets, No. 24 4.5be. Cold-finished steel bars 4.3be. Cold-finished steel bars 4.3be. Common wire nails, base per keg. 52.90 PACIFIC COAST Base per Lb. San Fran- Los clsc Angeles Seattle Plates. tank and U. M. 3.25c. 3.60c. 3.5be. Shapes, standard 3.25c. 3.60c. 3.5be. Soft steel bars 3.25c. 3.60c. 3.7be. Reinforcing bars 3.25c. 3.60c. 3.7be. Hot-rolled annealed sheets (No. 24) 4.00c. 4.35c. 4.4be. Hot-rolled annealed sheets (No. 24) 4.00c. 4.35c. 4.4be. Hot-rolled sheets (No. 4.5c. 4.95c. 5.0bc. Galv. sheets (No. 4.5c. 4.95c. 5.0bc. Codd finished steel Rounds 7.55c. 7.60c. 8.25c. Common wire nails base per keg less carload 7.55c. 7.60c. 8.25c. Common wire nails base per keg less carload \$3.20. \$3.20. \$3.30 All items subject to differentials for quantity.
Hot-pressed nuts, hex. tap or Hot-pressed nuts, hex. tap or blank. *70 Hex. head cap screws	*Base prices subject to deduction on orders aggregating 4000 lb. **CLEVELAND** *CLEVELAND** *CLEVELAND** *CLEVELAND** *Base per Lb. *Plates and struc. shapes 3.31c. *Soft steel bars 3.00c. *Reinforc. steel bars 3.50c. *Flat-rolled steel under '4 in 3.36c. *Cold-finished steel bars 3.50c. *Flat-rolled sneelad cheets (No. 24) 3.91c. *Gaivanized sheets (No. 24) 4.61c. *Hot-rolled sheets (No. 10) 4.61c. *Hot-rolled sheets (No. 10) 5.245 *No. 9 galv. wire. per 100 lb. \$2.45 *No. 9 galv. wire. per 100 lb. \$2.80 *Com. wire nails. base per keg 2.40 *TOutside delivery 10c. less. *For 5000 lb. or less. **Cold-finished bars 3.37c. *Bail steel reinforc. bars 3.37c. *Bail steel reinforc. bars 3.25c. *Hoops and bands, 3/16 in. and lighter 3.7c. *Cold-finished bars 1.7c. *Hot-rolled annealed sheets (No. 24) 4.7c. *Hot-rolled annealed sheets (No. 24) 4.7c. *Hot-rolled sheets (No. 10) 3.2c. *Somall rivets 5.5 per cent off lst. *No. 9 ann'i'd wire, per 100 lb. (1000 lb. or over) 2.88 com. wire nails, base per keg. *Com. wire nails, base per keg: Any quantity less than carload. 3.04 cent c't'd nails, base per keg: 3.50 chain, lin, per 100 lb. 8.35 com. Net per 100 lb. 8.35 com. Net per 100 lb. 1.20 chain, lin, per 100 lb. 8.35 com. Net per 100 lb. 1.20 chain, lin, per 100 lb. 8.35 com. Net per 100 lb. 1.20 chain, lin, per 100 lb. 1.20 chain. In, per 100 lb. 2.20 chain. In, per 100 lb. 1.20 chain. In, per 100 lb. 1.20 chain. In, per 100 lb. 2.20 chain.	*Price applies to 1,000 lb. and over. twith reduction in chemical extras. **0.25c. off list for 10 to 25 bundles? 0,50c. for 25 bundles and over, Detroit delivery only. **MILWAUKEE Base per Lh. Plates and structural shapes 3.31c. Soft steel bars, rounds up to 8 ln., flats and fillet angles 3.11c. Soft steel bars, rounds up to 8 ln., flats and fillet angles 3.25c. Hot-roiled strets (No. 20) 3.16c. Hot-roiled strets (No. 20) 4.66c. Cold-dishests (No. 20) 4.66c. Cold-dishest (No. 20) 4.66c. Cold-troiled strets (No. 20) 4.66c. Cold-troiled strip 3.35c. Structural rivets (kee lots) 3.85c. Track spikes (keg lots) 3.71c. Track spikes (keg lots) 3.71c. Track spikes (keg lots) 4.86c. Black annealed wire 3.5c. Com. wire nails 2.85c. Com. wire nails 2.85c. Com. vire nails 70 and 10 Prices given above are delivered Milwauke 70 and 10 Prices given above are delivered Milwauke 70 and 10 Prices given above are delivered Milwauke 70 and 10 Prices given above are delivered Milwauke 70 and 10 Prices given above are delivered Milwauke 70 and 10 Prices given above are delivered Milwauke 70 and 10 Prices given above are delivered Milwauke 70 and 10 Prices given above are delivered Milwauke 70 and 10 Prices given above are delivered Milwauke 70 and 10 On plates, shapes, bars, hot-rolled strin and heavy hot-rolled sheets, the base applies on orders of 400 to 999 lb. On galvanized and No. 24 hot-rolled annealed sheets with prices are for orders of 1000 lb. or more of a size. ST. PAUL Base per Lb. Mild steel bars, rounds 3.25c. Structural shapes 3.5c. Cold-finished bars 4.2c. Finance and bands the base applies on 400 to 15.999 lb. On hot-rolled sheets, palevanized sheets, No. 24 4.9c. Golvanized sheets, No. 24 4.9c. Golvanized sheets, No. 24 4.9c. Golvanized sheets, No. 24	NEW ORLEANS NEW ORLEANS Base per Lb Mild steel bars

 Plates
 3.38c

 Struc. shapes
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 Soft steel bars
 3.05c

 Reinforcing bars
 2.69c

Steel Production Rises Six Points at Cleveland



For 500 for 300 lb. add 100 lb.

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Output Now at 70 Per Cent— Second Quarter Prices Are Announced With Many Changes— Ford Inquires for Iron Ore

Second quarter prices have been announced on nearly all steel products by some producers and others are expected to adopt the new schedules that already have appeared. Present quotations have been reaffirmed on hot-rolled bars, plates and shapes, with new quantity differentials on bars allowing a deduction of \$3 a ton for 150 tons and over of one size and analysis shipped to one designation at one time. The extra on three to 10 tons is eliminated. Quantity differentials on plates and shapes are still under consideration.

The new set-up on sheets and strip provides for reaffirmation of present regular quotations with quantity deductions and extras which will allow large consumers a \$3-a-ton concession on 150 tons or more, the same as on bars. Rerolling billets, blooms and slabs have been reduced \$1 a ton and sheet bars \$2 a ton. Forging billets and skelp have been reaffirmed. Manufacturer's wire has been advanced \$2 a ton, nails have been reduced \$6 a ton and changes both up and down have been made on other wire products.

Ingot output in the Cleveland-Lorain district advanced six points this week to 70 per cent of capacity, Republic having put on one open-hearth furnace and Otis two furnaces. Demand for finished steel has increased. Considerable new business has come from automobile companies who have placed sheet and strip orders for March shipment.

The Chesapeake & Ohio Railroad is expected to have an inquiry out shortly for several thousand cars. The Erie Railroad's 19,000 tons of rails probably will be placed around the end of the month.

The Ford Motor Co. is inquiring for 490,000 tons of ore, compared with 180,000 tons a year ago.

Pig Iron

A moderate volume of activity has developed in contracts for the second quarter in lots from 100 to 1500 tons. This differs materially from the situation when books were opened in December for the current quarter. At that time contracting was very light because consumers were carrying over a great deal of low-priced iron.

Bars, Plates and Shapes

Hot rolled carbon bars have been reaffirmed for the second quarter at 1.85c., Pittsburgh, and 1.90c., Cleveland, but important changes have been made in the quantity differentials. Shapes and plates also have been reestablished at 1.80c., Pittsburgh. Under the new set-up the base price on bars, covers quantities under 25 to 3 tons instead of 25 to 10 tons as at present. This eliminates the \$1 a ton extra on 5 to 10 tons and \$1.50 on 3 to 5 tons now in effect. The extra on 3 to 2 tons is unchanged at \$3 a ton, but it is increased \$1 a ton to 25c. on 1 to 2 tons and \$10 a ton on quantities less than 1 ton. A deduction of \$3 a ton is allowed on 150 tons and over. The present \$2 a ton deduction is to apply on 100 to 150 tons. Present deductions on 25 to 100 tons are unchanged. Demand for bars continues quite active. Structural awards include 400 tons for a telephone building in Cleveland and 560 tons for construction in connection with the Great Lakes Exposition, Cleveland.

Semi-Finished Steel

Billets, blooms and slabs have been established at \$28 for the second quarter, a decline of \$1 a ton from the present official price, but \$1 a ton above the price in effect last fall. Sheet bars have been marked down \$2 a ton to \$28 from the present official price, bringing them back to the price that was in effect before the announced advance last fall. Forging quality billets, blooms and slabs have been reestablished at \$35. New prices have been prepared on wire rods but have not yet been officially announced. The new schedule is \$38 for Nos. 4 and 5 rods, \$40 for larger than No. 4 up to 15/32 in. inclusive and \$42 for 15/32 in. to 47/64 in. Larger sizes will be sold on a bar base.

Wire Products

New prices have been announced on wire products for the second quarter and represent both advances and declines. Nails are established at \$2.10 per keg, the



Pity the poor Maintenance Man in a plight like this:

• . . . a 24-hour-a-day job in the plant . . . men and equipment working at top speed . . . production, Production, and More Production! the cry . . . trouble develops in the Galvanizing Room . . . the sheets aren't taking it right . . . trouble traced to faulty cleaning . . . investigation shows pickle liquor not up to temperature . . . steam gauge pegged at 75 lbs. . . localized heating . . . what the hell! open end steam pipe in bottom of pickler shot . . . woe is me!

THERE'S NOTHING FUNNY ABOUT THAT
We don't intend it to be funny. The production line down at any time isn't funny. And it doesn't seem to add up right to take unnecessary chances of having something go haywire, if there is a preventive for it.

That's how some users feel about Duriron Circulating Steam Jets—that they forestall trouble at the pickler, besides getting a cleaner sheet at a lower pickling cost.

If you are not using Duriron Jets in your Pickling Department, it will pay you to investigate. We will be glad to send you further information, without obligation, of course.

THE DURIRON COMPANY, INC. 438 North Findlay Street - - - Dayton, Ohio

price at which they have been rather commonly quoted lately, which is a reduction of \$6 a ton from the official price. Manufacturers wire has been advanced \$2 a ton to 2.40 cents; spring wire \$3 a ton to 3.05 cents; annealed wire \$4 a ton to 2.65 cents; galvanized wire \$4 a ton to 3c. Galvanized barbed wire has declined \$4 a ton to 2.60c., and polished fence and galvanized staples \$4 a ton to 2.80c. and 3.05c. respectively. Woven wire fence is \$58, a \$3 decline and bale ties are \$51, a \$2 decline.

Bolts and Nuts

The 10 per cent extra discount that manufacturers have been allowing distributers for carload lots for stock shipment has been eliminated and all buyers hereafter will be quoted the same discounts. Contracts for the second quarter are now being closed. The volume of specifications shows an increase.

Sheets

New demand from the automobile industry has taken quite a spurt now that motor car manufacturers are increasing their production. Miscellaneous business has also increased. The expectation of firmer prices for the second quarter has caused some consumers to place larger orders than they otherwise would. Producers are accepting orders only for shipment prior to April 1 and some are filled

up with cold-rolled tonnage for the remainder of March.

Strip Steel

A revival in the demand from the motor car industry is in evidence. Some new business in hotrolled strip in substantial lots has come from non-integrated cold-rolling plants.

Iron Ore

The Ford Motor Co. has sent out an inquiry for 490,000 tons of Lake Superior ore, this company being the first, as usual, to issue an open market inquiry. This indicates a sharp increase in the Ford company requirements, as its inquiry last year was for 180,000 tons. This was supplemented by a purchase of about 75,000 tons later in the season. As the Ford inquiry is out a month earlier than last year, prices may be established somewhat earlier than a year ago. The Ford inquiry is for 120,000 tons of high phosphorus ore, 150,-000 tons of basic ore, 200,000 tons of 2 per cent manganiferous ore and 20,000 tons of silicious ore. Some of the steel companies owning their own mines are planning to ship considerably more ore this year than in 1935. Ore on docks March 1 amounted to 4,904,168 tons, as against 4,867,583 tons on the same date a year ago.

Scrap

Milder weather has resulted in an increase in the amount of scrap coming out and the market has an easier tone. Brokers are finding it far less difficult than recently to buy scrap to fill outstanding orders. However, no weakening in prices is reported. Consumers still have considerable scrap due on old contracts and no new purchases are being made. The present price of cast scrap is checking its demand from foundries.

Sheet Demand Is Up at Cincinnati

INCINNATI, March 10.—Liberal buying by sheet users during the past week has assured production for the remainder of this quarter at near the best levels attained in November and December. Stimulus was undoubtedly gained by price concessions. While mills look for firmer quotations on bookings for the second quarter such business is not being accepted until formal price announcements are made.

Mills insist that all materials be taken out by March 31 and ordering is not considered speculative. A trend toward heavier specifications in the automotive field, although not pronounced, was apparent. Requirements for household equipment are steadily heavier.

Steel making rates are unchanged at 78 per cent. One leading interest has as many openhearths in operation as during the preceding quarter. Another river mill is consistent in capacity operations.

Quotations on iron and steel scrap have been advanced 50c. a ton on all grades in line with miscellaneous sales to mills. Prices paid in the Valleys had a bullish effect in this district and have been followed by reports that scrap consumers in nearby districts, as well as here, are now applying pressure to prices in hope of checking increases attributed to weather conditions during the past weeks, which caused a stagnation in scrap collection.

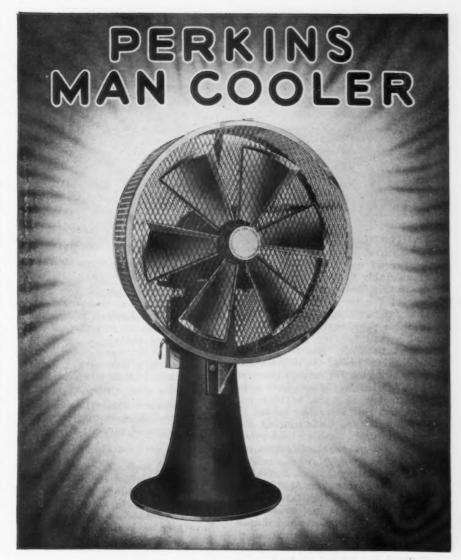
Pig iron buyers are entering the market for necessary requirements only, having no price inducements to encourage long commitments. Therefore, bookings for second quarter, with prices on both Northern and Southern iron reaffirmed, are light. New buying is more active, due to the expiration of old contracts. Shipments are showing a gain over February.

A pickup in specifications of byproduct foundry coke to melters on automotive parts is adding to the volume which is steady from other users.

Scrap Prices Are Higher at St. Louis

ST. LOUIS, March 10.—The price of barbed wire has been cut \$4 a ton and wire nails \$3 a ton, the reductions following price concessions which already had been made. Woven wire fence, on the other hand, is \$2 a ton higher. March has seen a little more movement of roofing, which has only tended to reduce the stocks jobbers already had on hand and has not resulted in any new buying from the mills. A marked pick-up in demand is now expected. Specifications for structural shapes are being received by the mills in greater volume.

The State of Missouri will open bids March 13 for road projects including 2400 tons of structurals for bridges, the largest being 1670 tons for a bridge in Kansas City and 210 tons for one in St. Louis. Laclede Steel Co. has been awarded 200 tons and the Missouri Rolling Mills Corpn. 1550 tons of reinforcing bars for two school projects in University City, Mo. United States



Oscillating and Stationary Types—Hundreds of users of Perkins Man Coolers have proven for themselves the wisdom of investment in Perkins Man Coolers.

Readily moved from place to place, they bring comfort to men working in hot places, resulting in decreased labor turnover, increased production and fewer accidents.

B. F. PERKINS & SON, INC., Holyoke, Mass. ENGINEERS AND MANUFACTURERS

Fire Proofing Co. has been awarded the general contract for an arsenal at Springfield, Ill., requiring 237 tons of reinforcing bars.

Scrap iron dealers have increased their buying prices of No. 2 heavy melting steel 50c. a ton in an effort to bring out more of that item from the country, following the recent sale of 10,000 tons to a district melter. No new buying has developed since then. Railroad

lists: Missouri Pacific, 100 carloads, and Wabash, 1300 tons, pending, and Missouri-Kansas-Texas, 16 carloads, most of which went to Kansas City, and St. Louis-Southwestern, eight carloads.

While there has been some buying of pig iron for second quarter requirements, most of the orders are for small lots for immediate use. March shipments are showing an improvement over last month.

Philadelphia Sellers Open Books for Second Quarter



Sheet, Strip and Bar Extras Favor Large Buyer—Consumers Purchase Ahead to Escape Firmer Prices— Scrap Unchanged

HILADELPHIA, March 10 .-Spurred by the knowledge that second quarter prices will be considerably firmer, many consumers in this area have come into the market for moderate tonnages of steel for immediate shipment. Most of these purchases constitute normal second quarter business, but buyers naturally enough wish to take advantage of the demoralized price situation for certain types of steel. Galvanized sheets have been sold as low as 3.11c. at Philadelphia, but this price has tended to firm up toward 3.41c. during the past several days. Cold-rolled sheets did not weaken to this extent and shading was confined mostly to larger buyers, but business is still being done at Philadelphia under 3.26c. for March delivery. There was no widespread weakness in bars, plates and shapes in this area, and reaffirmation of prices for second quarter has not changed the market setup here to any extent.

New discount cards for steel pipe show sizable reductions from first quarter levels. Despite this drop in steel pipe, iron pipe makers have not changed first quarter discounts for second quarter. Rerolling quality carbon steel blooms, billets and slabs are based \$1 lower at \$28, f.o.b. Pittsburgh; forging blooms, billets and slabs are unchanged at \$35, sheet bars are down \$2 to \$28, and skelp is unchanged at 1.80c.

The effect of very low sheet price on mills was demonstrated by the fact that Eastern Rolling Mill Co., Baltimore, was forced last week to cut workers' wages 10 per cent. A strike was averted by the management's promising a return to the usual rates when company operations show a profit.

The eastern Pennsylvania ingot production rate is unchanged at 41 per cent of capacity.

Pig Iron

Melters' stocks acquired late in 1935 are almost liquidated, and day-to-day bookings in this area are expanding to a moderate degree. Releases so far in March have been in heavier volume than for the equivalent period last month. In all probability, sellers will not enjoy much second quarter demand for at least several more weeks, inasmuch as large melters still have some vard stocks and are not inclined to cover their forward needs until they are forced to do so. Over 3500 tons of Dutch iron and 1000 tons of Indian iron were landed last week for local consump-

Bars, Plates and Shapes

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First quarter prices have been reaffirmed for second quarter delivery. Hot-rolled carbon steel bars and small shapes are quoted at 1.85c., base Pittsburgh, or 2.16c., delivered Philadelphia, and structural shapes and plates at 1.90c., base Bethlehem and Coatesvile respectively, or 2.015c. and 1.99c., delivered Philadelphia. The significant feature of the new prices is a revised quantity extra schedule on bars and small shapes. The new set-up calls for the base price on quantities of three to 25 tons. For quantities over 25 tons, certain deductions will apply which range up to 15c. a 100 lb. on shipments of over 150 tons to one place at one time. Orders under three tons call for additions to the base price which range up to \$1.50 a 100 lb. for orders under 1000 lb. Very few buyers in this area are in the position or care to purchase more than three tons of bars of one size and kind and most business here is expected to be done at the above base price on more. It is obvious that these quantity differentials will throw more business to the jobbers and will tend to eliminate very small mill orders.

Sheets

Second quarter prices have been announced as identical with published quotations, constituting in some cases an advance of from \$3 to \$5 over shaded quotations which have applied here for several weeks. As is the case on bars, a quantity differential system will apply to sheets and strip. base price will cover orders between one and 25 tons; deductions up to \$3 a ton may be made on larger lots, and extras range up to \$1 a 100 lb. for orders less than 1000 lb. As in the case of bars, this arrangement should throw many small orders to jobbers which

THE NATIONAL AUTOMATIC TOOL CO., of Richmond, Ind.



builders of precision drilling, boring, and reaming equipment, have found that Ampco is indeed "the Metal without an equal" for certain unusual and difficult applications. Guide bushings and bearing blocks, formerly made of hardened steel, have been found to give longer and better service when made of Ampco Metal Grade 21. Miscellaneous worm gears, feed nuts, locking plates, and shoes of Ampco Metal Grade 18 also are standard on "Natco" equipment.



Catalog of Ampco products on request.

AMPCO METAL, Inc.

MILWAUKEE, WISCONSIN

heretofore have been taken by mills directly. With these firmer quotations in prospect, sheet and strip buyers here are ordering in moderately heavy volume for immediate shipment. The Commonwealth of Pennsylvania is opening bids Thursday for 50 tons of zinc-coated sheets for road signs. All sellers expect bids for this material to be in line with the new second quarter quotations.

Imports

The following iron and steel imports were received here last week: 3518 tons of pig iron from the Netherlands; 1039 tons of pig iron from British India; 13 tons of steel tubes, and 14 tons steel bars from Sweden; 82 tons of steel bars, 2 tons of steel bands, and 125 tons of structural shapes from Belgium; 20 tons of steel bars, 8 tons of steel bands and 7 tons of structural shapes from France.

Scrap

The Claymont mill distributed No. 1 orders totaling 3000 tons last week on the basis of \$13.50, de-livered. Much of this steel will come from nearby dealers within switching distance. Scrap deliveries on old contracts are currently much more free than they were three weeks ago, and if the present mild weather continues it is probable that normal market turnover will soon be established. Needless to say, the brokers' quotation of \$13.50 to \$14.00 for No. 1 steel is being resisted by most district mills, and this resistance would probably have broken the market to some extent by now if it were not for the supporting effect of a revived export market. One broker is paying \$12.50 for No. 1 at Port Richmond. This price is about in line with brokers' bids for the same grade delivered to Coatesville. There has been some market sentiment to the effect that export purchases were deliberately revived by brokers with the intent of keeping the No. 1 steel market here at an artificially high level. However, the Japanese have purchased 7500 tons at Baltimore at between \$13.25 and \$13.35 and are negotiating for an additional tonnage at \$13.50.

Metal Trades Group To Meet in April

THE National Metal Trades Association will hold its thirty-eighth annual convention at the Waldorf-Astoria Hotel, New York, April 22 and 23. The subjects to be discussed will treat with industrial relations problems.



Make ONE MILL OUT OF MANY

With the introduction of the Continuous Flow Principle, handling materials in the steel and metal-working industries becomes an important factor in production efficiency. Mathews Conveyer Systems offer more than merely an alternative way of getting material to and away from different departments—they are designed to bring together plant operations so that every piece of equipment produces at a maximum. Ask for the book, "Problems Solved with Mathews Conveyer Systems."

MATHEWS CONVEYER COMPANY

San Francisco, Calif.

ELLWOOD CITY, PENNA.

Port Hope, Ont., Can.

Fabricated Structural Steel

Lettings in Good Volume-New Projects Gain

NORTH ATLANTIC STATES

Banger, Me., 290 tons, hospital building, to Lyons Iron Works.

Waltham, Mass., 300 tons, hospital units, to Lehigh Structural Steel Co.

Charlestown, Mass., 100 tons, brewery addition, to A. O. Wilson Structural Co. State of New York, 280 tons, State highway bridge, to Fort Pitt Bridge Works Co.

Brooklyn, 180 tons, addition to F. & M. Schaefer brewery, to Norton Steel Co.

Brooklyn, 460 tons, apartment house, Eighth Avenue and Carroll Street, to Belmont Iron Works.

Brooklyn, 1040 tons, public school No. 234, to Lehigh Structural Steel Co.

New Brighton, N. Y., 760 tons, Curtis high school, to Lehigh Structural Steel Co. St. Albans, N. Y., 220 tons, addition to public school 136, to Weatherly Steel Co.

Rochester, N. Y., 295 tons, central fire headquarters, to F. L. Heughes & Co.

Delaware County, N. Y., 190 tons, highway bridge, to Lackawanna Steel Construction Corpn.

State of New Jersey, 320 tons, highway bridges at Hasbrouck Heights and Lodi, to American Bridge Co.

Philadelphia, 340 tons, store, 10th and Market Streets, to American Fabricators Steel Co.

Noxontown, Del., 225 tons, alteration to church school, to Lehigh Structural Steel Hagerstown, Md., 140 tons, Montgomery Ward building, to Jones & Laughlin Steel Corpn.

Washington, 310 tons, bus garage, to Belmont Iron Works.

Philadelphia, 1190 tons, five public school buildings, to Fort Pitt Bridge Works Co.

THE SOUTH

Huntington, W. Va., 225 tons, Standard Ultramarine building, to James J. Weiler & Sons.

Dallas, Tex., 340 tons, exhibit building for Ford Motor Co., to Mosher Steel Co.

CENTRAL STATES

Portland, Mich., 265 tons, State highway bridge, to American Bridge Co.

Ecorse, Mich., 16,000 tons, plant addition for Great Lakes Steel Corpn., to Whitehead & Kales, Inc.

Gary, Ind., 205 tons, overhead bridge, to American Bridge Co.

Cleveland, 410 tons, Ohio Bell Telephone Co. building, to Fort Pitt Bridge Works Co.

Cleveland, 270 tons, bridge for Great Lakes Exposition, to Ingalls Iron Works Co.

Cleveland, 310 tons, automotive building for Great Lakes Exposition, to Fort Pitt Bridge Works Co.

Michigan, Minnesota, Wisconsin and

THE IRON AGE, March 12, 1936-107

HAVE YOU A CLUTCH PROBLEM?

—One where synchronization, remote control, operating safety and dependability are demanded?

There isn't any better solution than a Dings Magnetic Clutch.

Dings Magnetic Clutches will answer your demands for strength, quick action and long life.

There is a size for every problem. Let us tell you what we can do.



DINGS MAGNETIC SEPARATOR CO. 727 Smith St., Milwaukee, Wis.

Since 1899 Dings engineers have been building magnette equipment. Here is experience that no other manufacturer of this type of equipment can offer. Such experience has a real dollars and cents value to you.

Illinois, 265 tobs, 26 lookout towers, for Department of Agriculture, to Aermotor Co.

Macoupin County, Ill., 120 tons, bridge, to St. Louis Structural Steel Co.

Havana, Ill., 1760 tons, highway bridge, to Duffin Iron Works Co.

Chicago, 1300 tons, Ninety-fifth Street grade elimination, to Bethlehem Steel Corpn.

Decatur, Ill., 155 tons, Condit Street subway, to Mississippi Valley Structural Steel Co.

Evanston, Ill., 380 tons, State highway bridge, to Bethlehem Steel Corpn.

Melbourne, Iowa, 210 tons, State highway bridge, to Bethlehem Steel Corpn.

Kismet, Kan., 540 tons, State highway bridge, to Sibbitt Iron & Foundry Co.

WESTERN STATES

Fremont County, Colo., 170 tons, to Midwest Steel & Iron Co.

Pueblo County, Colo., 450 tons, grade crossings, to American Bridge Co.

Weld County, Colo., 465 tons, I-beam bridge, to Burkhardt & Sons Structural & Iron Works.

Fort Peck, Mont., 100 tons, miscellaneous steel requirements, to Des Moines Steel Co.

Santa Clara, Cal., 500 tons, Santa Clara River bridge, to Consolidated Steel Corpn.

Santa Monica, Cal., 700 tons, addition to factory of Douglas Aircraft Corpn., to Bethlehem Steel Co.

San Francisco, 530 tons, apartment house, to Bethlehem Steel Corpn.

NEW STRUCTURAL STEEL PROJECTS NORTH ATLANTIC STATES

Buskirk, N. Y., 100 tons, grade elimination for Boston & Maine Railroad.

Camden, N. J., 400 tons, building for Campbell Soup Co.

New Kensington, Pa., 1000 tons, building 44, Aluminum Co. of America.

State of Pennsylvania, 475 tons, four highway bridges.

Newark, Del., 150 tons, chemical laboratory for University of Delaware.

Amcelle, Md., 400 tons, building 73, Celanese Corpn.

Washington, 170 tons, Anacosta high school.

SOUTH AND SOUTHWEST

Charleston, W. Va., 2100 tons, bridge over Great Kanawha River.

Phoenix, Ariz., 1596 tons, structural and miscellaneous steel for Bartlett dam on Salt River Valley project; bids April 7.

Austin, Tex., 142 tons structural and 1596 tons miscellaneous, Arnold dam and power plant on Colorado River project; bids March 31.

CENTRAL STATES

State of Ohio, 1400 tons, four highway bridges.

Dearborn, Mich., 500 tons, tunnel shaft material for Ford Motor Co.

Grand Rapids, Mich., 200 tons, building for S. S. Kresge Co.

State of Iowa, 250 tons, bridges.

Springfield, Ill., 2000 tons, armory; United States Fireproofing Co. low bidder on general contract.

Chicago, 15,000 tons, outer drive bridge; Great Lakes Dredge & Dock Co. low bidder on general contract.

Chicago, 2500 tons, Randolph Street viaduct.

State of Missouri, 2400 tons, highway bridges, including Jackson County, 1670 tons: city of St. Louis, 210 tons, and smaller projects, 520 tons; bids March 13.

WESTERN STATES

Oakland, Cal., 3000 to 3500 tons, plant for Illinois-Pacific Glass Co.; bids soon. San Francisco, 700 tons, apartment house on Jackson and Laguna Streets; bids soon.

FABRICATED PLATES

AWARDS

Pittsburgh, 800 tons, four all-welded steel tank barges, for Standard Oil Co. of New Jersey, to Marietta Mfg. Co.

River Rouge, Mich., 3000 tons, welded steel gas holder for Ford Motor Co., to Stacey Gas Construction Co.

Baytown, Tex., 1175 tons, tanks for Humble Oil & Refining Co., to Chicago Bridge & Iron Works.

Barberton, Ohio, 235 tons, 17 tanks for Pittsburgh Plate Glass Co., to Chicago Bridge & Iron Works.

Louisville, Ky., 185 tons, brewery tanks, to Drummond Mfg. Co.

Long Beach, Cal., 2000 tons, water tanks, to Western Pipe & Steel Co.

San Francisco, 1210 tons, 36-in. pipe for Treasury Department, to Steel Tank & Pipe Co.

Sacramento, Cal., 213 tons, two tanks for city, to Western Pipe & Steel Co.

NEW PROJECTS

Tigerton, Wis., closes bids March 24 for a 60,000-gal. steel water tank on a 100-ft. steel tower for new waterworks plant. R. C. Heins is village clerk.

Sheridan, Wyo., 1280 to 1700 tons, 80,000 ft. of 16-in. pipe, alternates on cast iron pipe; new bids expected to be taken within

Railroad Equipment

St. Louis-San Francisco has applied for permission from Federal court to spend \$406,494 for mechanical department improvements, \$298,048 for bridges, trestles and culverts, \$137,991 for signals and interlockings, and \$104,217 for widening cuts and fills.

Santa Fe will air condition 125 passenger cars.

Northern Pacific has ordered 12 locomotives from American Locomotive Co.

Trustees of the New York, New Haven & Hartford have asked court permission to buy 12 locomotives and 50 passenger coaches.

Timken Roller Bearing Co., Canton, Ohio, had taken following railroad orders in addition to those announced last week: Edward G. Budd Mfg. Co., Philadelphia. will equip with bearings and boxes all axles of two 10-car and two 6-car lightweight stainless steel trains for Burlington; Pullman-Standard Car Mfg. Co., Chicago, bearings and boxes for the fourth streamlined Diesel train, "The City of San Francisco," and also for three extra Diesel locomotive units for Union Pacific; H. K. Porter Co., Pittsburgh, bearings to equip all driving axles of 73-ton six-wheel fireless locomotive for Great Lakes Steel Corpn., Detroit; and J. G. Brill Co., Philadelphia, to equip all journals of 10 new electric motor cars for the Uruguayan State Railways, Montevideo, Uruguay.

RAILS AND TRACK SUPPLIES

Chesapeake & Ohio has awarded 12,000 tons of rails to Carnegie-Illinois Steel Corpn., 6000 tons to Inland Steel Co. and 2000 tons to Bethlehem Steel Corpn.

St. Louis-San Francisco has applied for permission to spend \$750,387 for new rails and track materials.

Kansas, Oklahoma & Gulf has ordered 5700 tons of rails from Carnegie-Illinois Steel Corpn.

108-THE IRON AGE, March 12, 1936

Steel Sales Lighter in Metropolitan District



Announcement of Second Quarter Prices with Important Changes in Quantity Extras and Base Quotations Is Expected to Benefit Demand

EW YORK, March 10.-With the announcement of second quarter prices on all finished steel products, sales in this area are expected to recover any volume lost last week when the price structure was still unset-Aggregate tonnage booked thus far in the month, however, is well ahead of the corresponding showing in the first 10 days of February, but some of this business was taken by consumers in order to take advantage of shaded quotations. In all cases, mills will insist upon shipment during March in order that second quarter books may be free of low-priced business.

The railroads are still ordering out considerable steel, but have placed no important new tonnage in the last week. New inquiry for fabricated structural steel is light, but a number of large jobs are still in the offing. Bids were opened yesterday on the highway bridge over the Connecticut River at Middletown, Conn., and early action is expected on the 12,000 tons of steel required.

Among the products on which base prices have been reaffirmed for second quarter are rails, track accessories, shapes, plates, tin plate and bolts, nuts and rivets. While base prices on some forms of sheets, strip steel and bars are unchanged, the application of quantity differentials will result in reductions to very large buyers almost as great as recent cuts in prices. The net change, however, will be upward as compared with recent minimum quotations, with advances of \$3 a ton over recent going prices in many instances. An exception is made in the case of vitreous enameling stock which is \$3 a ton lower at 2.95c. a lb., Pittsburgh.

As in the case of bars, sheets and strip will be subject to quantity differentials. Orders of one to 25 tons of one size and grade will be taken at the base prices, while deductions of \$1 to \$3 a ton may be made on larger lots of the same size and grade for shipment to one place at one time. Orders of

1000 to 1999 lb. will carry an extra of 50c. a 100 lb., while lots of less than 1000 lb. will be subject to an extra of \$1 a 100 lb.

Increased discounts on butt-weld and lap-weld pipe will bring about a net reduction of about \$4 a ton, although buyers in this district had enjoyed prices this low in recent weeks. The new pipe cards quote net discounts subject to no supplementary discounts except in the case of large jobbers, who will be allowed 5 per cent off.

On semi-finished steel, the old prices which were in effect prior to the paper advance of last October are again quoted. Billets, slabs and sheet bars are at \$28 a ton, Pittsburgh, and skelp at 1.80c., Pittsburgh, unchanged.

Wire rods will be quoted on the basis of size, with prices ranging from \$38 to \$42 a ton. Manufacturers' wire is advanced \$2 a ton to 2.40c. a lb., Pittsburgh, and

spring wire \$3 a ton, to 3.05c. a lb. Recent low prices on nails are recognized with a price of \$2.10 a keg, Pittsburgh, to the trade. Annealed fence and galvanized wire are removed from the nail card and quoted at 2.65c. and 3.00c. a lb. respectively.

Pig Iron

Sales have shown a moderate improvement lately, but buyer reticence is still a factor. report that, in contrast to the habits of former years, consumers are hesitant about making second quarter commitments at an early date. A. P. Smith Co., Bloomfield, N. J., proved an exception by closing for 600 tons. The contract was divided among several interests. Another northern New Jersey foundry is inquiring for 500 tons. Brooklyn foundries are operating on an average of three days out of five. Certain of the larger and more prosperous establishments, of course, are doing better than this by running four and five days a week, but numerous small jobbing foundries, oppressed by the State silicosis enactment, are finding it difficult to make ends meet. To a certain extent, new inquiry for pig iron has been retarded also by indirect considerations as to the trend of various finished steel prices which have not been promptly determined upon for second quarter needs.

Reinforcing Steel

Increased activity is expected in the reinforcing bar market as the

NICKEL SCRAP

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The export market offers most favorable outlets. Compare our terms with those you are now obtaining. Advise us details of your accumulations.



PHILIPP BR

BROTHERS, INC.

70 PINE STREET.

NEW YORK, N. Y.



advent of milder weather releases a number of projects which have been held back by the adverse conditions of the past two months. The largest booking of the past week was 625 tons for the Viscose Co., Meadville, Pa., by Concrete Steel Co., which also was awarded 170 tons for a building of the Boynton Realty Co. In New Jersey, through the State procurement division of the Treasury Department, about 100 tons consisting of several small jobs was divided between Julius Orhlin and Egleston Brothers & Co. Contract 12, involving 1000 tons for a sewer in the Bronx, which has been pending for several weeks awaiting PWA approval of the award to Rodgers & Hagerty. Inc., contractor, is finally settled. The new prices which were effective March 1 seem to be meeting with approval and the general opinion is that a more marked degree of firmness will prevail in the future.

Scrap

The current market is just as uncertain as it was a month ago when snow and ice were holding up deliveries. Even though very favorable weather has ruled for the past two weeks, there has been no inrush of scrap nor have prices exhibited any weakness. Of course this market is dependent to some extent on the attitude of foreign buyers; that is, if export shipments should continue to lag, present prices would tend to drop off. However, if new business develops to

any extent, there is considerable possibility that current quotations will be maintained for some time, or even advanced slightly. Both Japan and Italy have been out of the market recently, and current export business for the most part is directed toward the British Isles. Brokers look for Italy to reenter the market soon to a modest degree, and Japanese buyers insist that their purchases will soon expand to a more normal level. In the absence of urgent export demand, all interest here is centered in the eastern Pennsylvania area. No. 1 and No. 2 are bringing around \$11 and \$10 respectively at nearby New Jersey points for delivery into the Philadelphia area, and all grades of cast continue to be in heavy demand for delivery into the same district. Very little specialty steel is currently leaving here for the Pittsburgh district.

Pig Iron Buying Slow at Boston

DOSTON, March 10.—With operations still hampered by snow and ice, and most foundries covered through April, pig iron buyers have been slow in placing second quarter business. Local pig iron sales in the first nine days of this month did not exceed 2500 tons. However, the current New England melt, aside from Connecticut, is at 40 to 45 per cent of capacity,

and orders for castings are beginning to increase. Consequently furnaces anticipate increased pig iron buying before the close of March. Iron prices, with the exception of small lots of Continental, are holding. Work at the Mystic Iron Works plant has been hampered by weather conditions. Indications now are the furnace will not blow in much before the middle of April.

The export scrap market is more active and there has been a little more doing for Pittsburgh delivery. A steamer left here the past week with 2350 tons for Scotland. 850 tons of which were loaded at Norfolk. Included was 900 tons of local steel turnings. A steamer with better than 7000 tons is due to sail this week for Italy. Charters have been made for three steamers to arrive within three weeks, and a fourth vessel is under negotiation. A steamer started loading a round tonnage at Providence, R. I., for Scotland yesterday morning.

For No. 1 steel, local exporters are paying \$10.75 a ton, delivered army base, for carlots and \$11 for larger quantities, and \$1 less for No. 2 steel, the same as a week ago. For Pittsburgh delivery breakable cast has been upped 50c. a ton. Most offers for No. 1 steel are at \$16 a ton, delivered Pittsburgh. No. 1 machinery cast for Pennsylvania is moving at \$9 to \$9.25, f.o.b., and No. 1 textile cast is \$8.50 to \$8.75. With No. 1 steel at \$16 a ton, Pittsburgh, and \$11, local Army Base, brokers with American Steel & Wire Co., Worcester. Mass., contracts are having difficulty in securing tonnages.

Production Holding In Buffalo Area

DUFFALO, March 10.—Bethlehem's Lackawanna plant is maintaining this week its operation of 12 open-hearths, and Republic Steel Corpn. is continuing with three. Seneca sheet division of Bethlehem is at 75 per cent, and Wickwire-Spencer Corpn. is operating one open-hearth furnace.

The outlook for fabricated structural and reinforcing bar business is good, though no large commitments are reported during the past week. Makers are exceedingly optimistic regarding future business, and bar makers especially report heavy booking of lots under 100 tons.

The pig iron business shows shipments steady and new business consistent. Foundries are apparently operating well on the average, and about as they have been for some weeks past.

The feature of the market for old material is that the largest consumer of No. 1 and No. 2 heavy melting steel has come into the market for a No. 1 tonnage, having delayed this move for many weeks. By the time this is printed this mill will probably have bought be tween 5000 and 10,000 tons at \$13.50 for the No. 1.

This move confirms the ideas dealers have had for the past two months that this mill would be compelled to buy before the opening of spring navigation. This price is considerably above the figure previously offered by this interest and was undoubtedly due to the fact that scrap tonnage is moving freely out of this city and district for Youngstown consuming points, an operation only possible with a wide discrepancy between the local and Valley prices. Starting with a trickle of tonnage out of the nearby district, this trade had expanded to a volume with material moving out of the city limits to Ohio points. Denuding of this area by the Ohio mills led directly to the order to purchase, and at the market.

Large Dams Up for Bids in Far West

S AN FRANCISCO, March 10.— Three Bureau of Reclamation projects topped the rather abbreviated list of new steel inquiries reported during the past week. The date for bids was set on the Bartlett dam, to be constructed in Salt River Valley near Phoenix, Ariz., in which 2750 tons of reinforcing bars and 1596 tons of shapes and plates will be involved. At Austin, Tex., the Bureau will open bids the end of the month for the construction of the Arnold dam and power plant and the Hamilton dam. Alternates specify 250 or 1900 tons of reinforcing bars, 142 tons of structural steel and 275 tons of miscellaneous steel. Plans are being completed for the Fresno dam on Milk River, near Malta, Mont., which will cost approximately \$2,-000,000.

Indicative of the revival of industrial construction on the Coast are the plans of the Illinois-Pacific Glass Co. for a plant at Oakland, Cal., in which 3000 to 3500 tons of shapes will be involved. A plant at Long Beach for the Spencer Kellogg Co. will require 800 tons of bars. Structural requirements of two apartment houses at San Francisco aggregate 1230 tons.

The award at San Francisco of 1210 tons of plates to Steel Tank



& Pipe Co. by the Treasury Department featured the week's limited bookings. American Bridge Co. is reported to have taken 4270 tons of ring beams and splice plates, 1744 tons of purlins and clip angles and 293 tons of bolts for tunnel excavation bracings at Fort Peck dam.

Some intimation of changes in the reinforcing bar schedule has resulted from the difference in bid prices on a recent major Government contract for material for Fort Peck. Otherwise prices seem firm with no changes anticipated.

Cast Iron Pipe

Greenwich Water Co., Greenwich, Conn., plans extensions in pipe lines for water system and installation of other water service equipment. Cost over \$75,000.

Birmingham has low bid from United States Pipe & Foundry Co., for 2200 tons of various sizes for new industrial water system, at price of about \$100,000. Bids will be asked soon for steel pipe for sections of system. Sanborn & Bogert, 30 Church Street, New York, are consulting engineers. Entire project will cost about \$5,800,000

Gloucester County Sanitary District No. 1, Court House, Gloucester, Va., closes bids March 16 for pipe for water system and other waterworks installation. R. Stuart Royer, Builders' Exchange Building, Richmond, Va., is consulting engineer. Fund of \$34,000 has been arranged.

Board of Wise County Supervisors, Wise, Va., has extended date of closing bids from March 12 to March 24 for pipe for water system, recently referred to in these columns: also for 75,000-gal. storage tank. etc. Wiley & Wilson, Lynchburg, Va., are consulting engineers.

Michigan City, Ind., closes bids March 16 for 5210 ft. of 6 and 8-in. for water system in Lake Shore Drive. Greeley & Hansen, 60 North Michigan Avenue, Chicago, are consulting engineers.

Biggsville, Ill., plans pipe lines for extensions in water system. Fund of \$20,-000 has been authorized. Proposed to begin work soon.

Random Lake, Wis., at special election March 3 voted to build waterworks and sewerage system to cost about \$120,000.

Twin Falls, Idaho, plans pipe lines for water system, including about 14 miles of 24-in. for main trunk line from new source of supply. It is proposed to arrange bond issue of \$300,000 for entire project. Duncan Johnston, mayor, is at head of program.

Dayton, Idaho, plans extensions in pipe lines for water system. Fund of \$25,000 is being arranged for this and other waterworks installation.

Woodlake, Tulare County, Cal., plans pipe lines for water system. Special election will be held early in April by Doodlake Utility District to vote bonds for this and other waterworks installation. D. B. Smith, chairman, in charge.

Palo Alto, Cal., plans 13,830 ft. of 6 and 8-in. for extensions in water system in Embarcadero Annex District. Cost about \$25,000. Financing is being arranged.

Ogden, Utah, will soon take bids for about 4500 ft. of 24 and 30-in. for main trunk line water supply from city reservoirs. Fund of \$60,000 has been arranged through Federal aid.

Bremerton, Wash., has placed 120 tons of 4 to 12-in. with United States Pipe & Foundry Co.

Fresno, Cal., let 213 tons of 4 to 8-in. to United States Pipe & Foundry Co.

Seal Beach, Cal., has placed 216 tons through a general contractor's letting.

Suisun, Cal., has awarded 183 tons of 4 to 12-in. to an unnamed bidder.

Sheridan, Wyo., is expected to call for bids within 60 days on water system improvements requiring 4290 tons of 16-in., with alternates on steel.

Treasury Department, Los Angeles, opened bids March 11 on 135 tons of 4 and 8-in.

THE IRON AGE, March 12, 1936-111

Higher Price for Copper Abroad Fails to Shake 91/4c. Domestic Level

Domestic Stocks of Zinc Decline 3690 Tons During February—Lead Market Buoyant Despite Preceding Heavy Sales—Tin Futures Face Active Demand

EW YORK, March 10 .- The most recent development of significance in the copper market has been the substantial rise in the price of the red metal abroad. Sales of electrolytic yesterday in London were made at the equivalent of 9.12½c. a lb., and today the price is reported at 9.10c. in the majority of transactions. Following upon the heels of the latest war scare on the Continent, it appears logical that armament purposes are either directly or indirectly behind the heavier buying trend. In the domestic market, however, there has occurred no corresponding increase in business. Conditions today are reported quiet, and consumers evidently are unconcerned over the

possibility of higher prices here for the time being. The 9.25c. a lb. quotation prevails as heretofore, although 9.50c. is still being asked by certain large interests. In keeping with the situation abroad, export business has picked up. Provided prices on the Continent continue to mount, an additional incentive for all sellers here to advance to 9.50c. should be provided.

Trading in this market was a dull affair throughout most of last week, but yesterday interest strengthened considerably and quite heavy tonnages were sold. An important tin plate producer is said to have done the bulk of the buying, chiefly for April needs.

Smaller lots booked on behalf of miscellaneous users were less discriminating as to positions, but, in general, spot positions suffered by comparison with futures. One reason advanced for the interest displayed by consumers yesterday was the war scare in Europe. Buyers may possibly have become anxious to make sure of supplies for the next two or three months at least. On the other hand, April positions at present are selling at quite a large discount under spot, and this factor may have been the principal stimulant in a more active market. The price for spot Straits metal at New York, which has varied only fractionally all week, is 48.30c. a lb. today. London standards were quoted this morning at £214 14s. for spot and £205 for futures. The Eastern price was £210 5s.

Zinc

A further reduction in domestic zinc stocks has been reported for February by the American Zinc Institute. At the month's end, stocks stood at 75,517 tons, a decrease of 3690 tons since January. Production of 36,228 tons contrasts with 41,917 tons for January, while shipments declined to 39,918 tons from the preceding figure of 46,468 tons. Regardless of the prevailing quiet trend of the market, these figures cannot be viewed other than in a favorable light. Stocks, for example, are equivalent to barely more than two months' needs at the present rate of consumption, and while it cannot feasibly be argued that consumption ordinarily expands by leaps and bounds, demand very often does. Any reasonable assurance that the trend of consumption is upward usually suffices to impel consumers to buy ahead, and a rate of demand aggravated additionally by the knowledge of limited stocks should very rapidly exhaust that supply. In such a contingency, prices, of course, would advance early.

Recent events in this market may have led to the opinion that a quiet period was in store as a consequence of heavy sales when prices advanced. Current indications, however, are that a moderate to fair volume of business is being transacted daily. While not equally strong in all directions, new demand has been sufficient to have caused at least one important producer to accumulate extensive waiting lists despite recent heavy bookings. This feature combined with satisfactory sales by other interests makes the present price level of 4.60c. a lb. appear very firm.

The Week's Prices. Cents Per Pound for Early Delivery

	March 4 A	Iarch 5 1	March 6 M	Jarch 7 M	Iarch 9 M	farch 10
Electrolytic copper, Conn. *	9.25	9.25	9,25	9.25	9.25	9.25
Lake copper, N. Y	9.37 1/2	9.371/2	9.37 1/2	9.37 1/2	9.37 1/2	9.371/2
Straits tin, Spot, New York	48.25	48.87 1/2	48.50		48.30	48.30
Zinc, East St. Louis	4.90	4.90	4.90	4.90	4.90	4.90
Zinc, New York†	5.27 1/2	5.271/2	5.27 1/2	5.27 1/2	5.27 1/2	5.271/2
Lead, St. Louis		4.45	4.45	4.45	4.45	4.45
Lead, New York	4.60	4.60	4.60	4.60	4.60	4.60

*Delivered Connecticut Valley; price ¼c. lower delivered in New York.
†Includes emergency freight charge.

Aluminum, virgin 99 per cent plus, 19.00c.-22.00c. a lb., delivered.
Aluminum, No. 12 remelt, No. 2 standard, in carloads, 17.00c. lb., delivered.
Nickel, electrolytic, 35c. to 36c. a lb. base refinery, in lots of 2 tons or more.
Antimony, Asiatic, 13.25c. a lb., New York.
Quicksilver, \$77.50 to \$80.00 per flask.
Brass ingots, commercial 85-5-5-9, 9.50c. a lb., delivered; in Middle West ¼c. a lb. is added on orders for less than 40,000 lb.

From New York Warehouse Delivered Prices, Base per Lb.

Tin, bar		
Copper, Lake 10.25c. to		
Copper, electrolytic. 10.25c. to		
Copper, castings10.00c. to		
*Copper sheets, hot-		
		50c.
*High brass sheets.	14.	62 1/2 C.
•Seamless brass		
	16.	87½c.
Seamless copper		
		00c.
Brass rods	13.	12 1/2 C.
Zinc, slabs 5.75c. to	6.	7oc.
Zinc, sheets (No. 9),		
casks, 1200 lb.	10	25c.
Lead, American pig. 5.10c. to		
Lead, bar 6.10c. to		
		25c.
Antimony, Asiatic. 14.00c. to		
Alum., virgin, 99 per	20.	000
cent, plus	23.	30c.
Alum., No. 1 for re-		
melting, 98 to 99		
ner cent 18 50c to	20.	00c.
Solder, 1/2 and 1/2 29.50c. to	30.	50c.
Babbitt metal, com-		
mercial grades 25.00c. to	60.	00c.

*These prices are also for delivery om Chicago and Cleveland ware-

From Cleveland Warehouse

Delivered Prices per Lb.

Copper, Lake 10.25c. to 10.50c.
Copper, electrolytic. 10.25c. to 10.50c.
Copper, castings10.00c. to 10.25c.
Zinc, slabs 6.50c. to 6.75c.
Lead, American pig. 5.20c.to 6.50c.
Lead, bar 8.50c.
Antimony, Asiatic16.50c.
Babbitt metal, medium grade. 19.00c.
Babbitt metal, high grade56.37 1/2 c.
Solder, 1/2 and 1/2

Old Metals, Per Lb., New York

Buying prices are paid by dealers for miscellaneous lots from smaller accumulators, and selling prices are those charged to consumers after the metal has been prepared for their uses. (All prices are nominal.)

	Buying	' Dealers' Selling Prices
Copper, hvy. cruci-	7.25c.	8.00c.
Copper, hvy. and wire	7.12½c.	7.62½c.
Brass, heavy	6.12½c. 4.00c.	6.62½c. 4.62½c.
Brass, light Hvy. machine com- position	3.25c. 6.00c.	4.00c. 6.50c.
No. 1 yel. brass turnings	5.12 ½ c.	
No. 1 red brass or compos. turnings	5.62 ½ c.	6.12½c.
Zinc		
Sheet aluminum	13.25c.	14.75c.

Republic Announces Official Publication Of Price Lists—Adopts Quantity Differentials

N announcing second quarter prices on sheets, March 10, the Republic Steel Corpn., Cleveland, made provision for quantity discounts in the sale of hot and coldrolled sheets and long ternes. Another innovation was the official publication of the price list, embodying the statement that "if and when any change is made in the price as announced, supplementary or revised announcement will be issued."

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The official published statement that no change in price will be made without announcement is believed to bind the company to adhere to open price practices and it is assumed that any deviations from such practices would make the company liable under the Clayton act.

Quantity deductions were published in a booklet by the company, dated March 2. They provide for deductions of from \$1 to \$3 a ton, dependent on the quantity released for shipment at one time. These deductions vary from \$3 per ton on shipments of over 150 tons to \$1 per ton on shipments of from 25 to 50 tons. The base price applies on lots of one to 25 tons.

In making the announcement, Tom M. Girdler, president and chairman of Republic, said that "the new method of issuing prices had been adopted by Republic in expectation that it would lead to elimination of unfair trade practices which have grown up in the steel industry."

"These unfair practices," he continued, "have included secret concessions, discriminatory prices as between customers, rebates and other methods harmful alike to producer and consumer.

"The steel industry has become notorious for such practices and for its inability to earn a fair profit. By eliminating these practices and adopting, for the first time in its history, a sound merchandising policy, the steel industry could make a great contribution to general recovery. I regard this as an obligation to the 450,000 employees dependent upon the industry and to the industry's stockholders, as well as to the country at large."

Extras and Deductions on Sheets

The following extras and deductions, in cents a 100 lb., to be de-

termined by the total weight of the size and gage ordered of one grade or analysis, released for shipment to one destination at one time, apply on hot and cold-rolled sheets and strip and long ternes:

150 ne	t to	ns	and	over	deduct	\$0.15
Under	150	to	100	net	tonsdeduct	.10
Under	100	to	50	net	tonsdeduct	.071/2
Under	50	to	25	net	tonsdeduct	.05
Under	25	to	1	net	tons	Base
Under	1 n	et :	ton	to 16	000 lbadd	.50
Under	1000) 11			add	1.00

If the exact quantity is required on any item of sheets under 3/16 in. thick, regardless of tonnage, an extra of 10c. a 100 lb. therefore shall be charged.

Extras on Hot-Rolled Bars Revised

Following are revised quantity extras and deductions, in cents a 100 lb., to be added to, or deducted from, the net price of hot-rolled bars. These extras and deductions are to be determined by the total weight of the size ordered (each gage or thickness of a section is a separate size) of one grade or analysis released for shipment to one destination at one time. On quantities up to 10 tons, shipment of 10 per cent over or under and

on quantities 10 tons and over, shipment of 5 per cent over or under is permissible:

In Territory Other Than *Birmingham and **Mid-west

Quantities 150 net tons or over
deduct \$0.15
Quantities under 150 to 100 net
tons, incldeduct .10
Quantities under 100 to 50 net tons,
incldeduct .07½
Quantities under 50 to 25 net tons,
incldeduct .05
Quantities under 25 to 3 net tons,
incl Base
Quantities under 3 to 2 net tons,
incladd .10
Quantities under 2 to 1 net tons,
incl
Quantities under 1 net ton to 1000
lb., incladd 1.00
Quantities under 1000 lbadd 1.50
In Birmingham and **Mid-west Territory
Quantities 100 net tons or over
deduct \$0.10
Quantities under 100 to 50 net tons,
incldeduct .07½
Quantities under 50 to 25 net tons,
incldeduct .05
Quantities under 25 to 1 net tons,
incl Base
Quantities under 1 net ton to 1000

*Birmingham territory includes places where the Birmingham base prices plus the all-rail carload published tariff rate would determine the lowest all-rail delivered price.

lb., incl......add .25 Quantities under 1000 lb.....add .50

**Mid-west territory covers sales based on Gulf Port prices, as well as sales for shipment into Arkansas, Colorado, Montana, Oklahoma, Utah, Arizona, Idaho, New Mexico, Texas, and Wyoming.

An air leak equal to 16" diameter hole costs \$28.00 per month. Air is expensive, control it efficiently and accurately with a NOPAK valve

\$28.00 per month. Air is expensive, control it efficiently and accurately with a NOPAK valve—a patented leak-proof valve guaranteed to stay tight without maintenance. Its flat, patented disc together with a packless spindle prevents sticking and assures you of many years of leak-proof operation. Permits throttling or quick opening. Easy to operate. Seat protected at all times and cannot wear out. NOPAK valves are suitable for air, gas, water, or oil. Write for Bulletins.

Made in shut-off, three-way and jour-way styles $\frac{1}{4}$ " to 2" pipe openings, three and four-way for operating single and double acting cylinders.



ALSO COMPLETE LINE OF BALERS: Electric and Hydraulic, also HYDRAULIC PRESSES and PUMPS



Plant Expansion and Equipment Buying

Miscellaneous Users Support Steady Tool Demand

A STEADY demand for single tools is maintaining the backlog of the manufacturers in the various districts, while the inquiries and purchases bear proof that expansion of capacity may provide outlets for considerable tool volume, during the current year.

The demand for millers, lathes and grinders appears unabated, but there is still a slight easing in the demand for drilling machinery, this past week.

Inquiries from the Detroit area have reverted to standard machines. Miscellaneous users have forged to the front as the strongest element in the current market.

◀ NORTH ATLANTIC ▶

American Can Co., 230 Park Avenue. New York, plans one-story addition to branch plant at Baltimore. Cost over \$50,-000 with equipment.

Spring Products Corpn., 175 Walnut Avenue, Bronx, New York, manufacturer of bed springs, furniture springs, etc., has leased three-story building at Amstel Place, Twenty-seventh Street and Skillman Avenue, Long Island City, about 115,000 sq. ft. floor space, for new plant. Present works will be removed to new location, acquired building providing about double amount of floor area of Bronx factory.

New York State Department of Maintenance, State Office Building, Albany. N. Y., plans machine shop and mechanical service department in new multi-story service and garage building near State Office Building for State-owned automobiles. Cost over \$400,000 with equipment. W. E. Haugaard is architect, and T. F. Farrell, engineer, both State Office Building.

Superintendent of Lighthouses, St. George, Staten Island, N. Y., asks bids until March 19 for 50 acetylene buoy lanterns (Proposal 50701).

Burden Iron Co., South Troy, N. Y., plans extensions and improvements, including new equipment, for production of lightweight alloys and other specialties. Cost close to \$250,000 including machinery. Company has recently been reorganized with Alfred Musso as president, and Robert Kemp, vice-president.

Safety Tire & Rubber Co., 29-18 Fortieth Avenue, Long Island City, plans rebuilding part of two-story plant recently destroyed by fire. Loss close to \$100,000 with equipment. Thomas F. Gallagher is one of heads of company.

Bureau of Supplies and Accounts, Navy Department, Washington, asks bids until March 17 for corrosion-resisting steel hangar hatch covers and spare parts for Brooklyn and Philadelphia navy yards (Schedule 7365); until March 20 for eight electric grinders for Brooklyn yard (Schedule 7352).

Ford Radio & Mica Corpn., 850 Fourth Avenue, Brooklyn, manufacturer of radio equipment and parts, has leased building at 536-40 Sixty-third Street, and will remodel for new plant.

Reynolds Metals Co., Inc., 19 Rector Street, New York, manufacturer of metal foils and kindred specialties, with main works at Louisville, has acquired property and buildings of Lucey Mfg. Corpn., Chattanooga, Tenn., manufacturer of boilers, plate products, etc., now in liquidation, and will occupy for new plant. Improvements will be made in existing structures, primarily for production of new metal foils for building insulation, recently developed by company. Cost over \$200,000 with equipment.

Signal Supply Officer, Army Base, Brooklyn, asks bids until March 16 for 16,000 ft. cable and 16 reels (Circular 157); until March 24, 500 jacks, control boxes, plug terminal strips, selector switches, changeover switches, control switches, control

and selector switch knobs and other equipment (Circular 148); until March 27, 3200 jack boxes (Circular 151).

National Radiator Corpn., Johnstown, Pa., manufacturer of steam rediators for domestic service, parts, etc., has taken over building at 574 Ferry Street, Newark, N. J., for new Eastern branch plant.

F. L. Smidth & Co., North Avenue, Elizabeth, N. J., manufacturers of cement-working machinery and other heavy equipment, parts, etc., have let general contract to Samworth-Hughes Co., 177 Van Houten Street, Paterson, N. J., for one-story addition, 50 x 175 ft. Cost over \$75,000 with equipment.

Hajoca Co., Walnut and Thirty-first Streets, Philadelphia, manufacturer of plumbing equipment and supplies, has leased two-story building at Miller and King Streets, Newark, N. J., about 24,000 sq. ft. floor space, for new factory branch storage and distributing plant. Present branch at 120 Frelinghuysen Avenue, Newark, will be removed to new location.

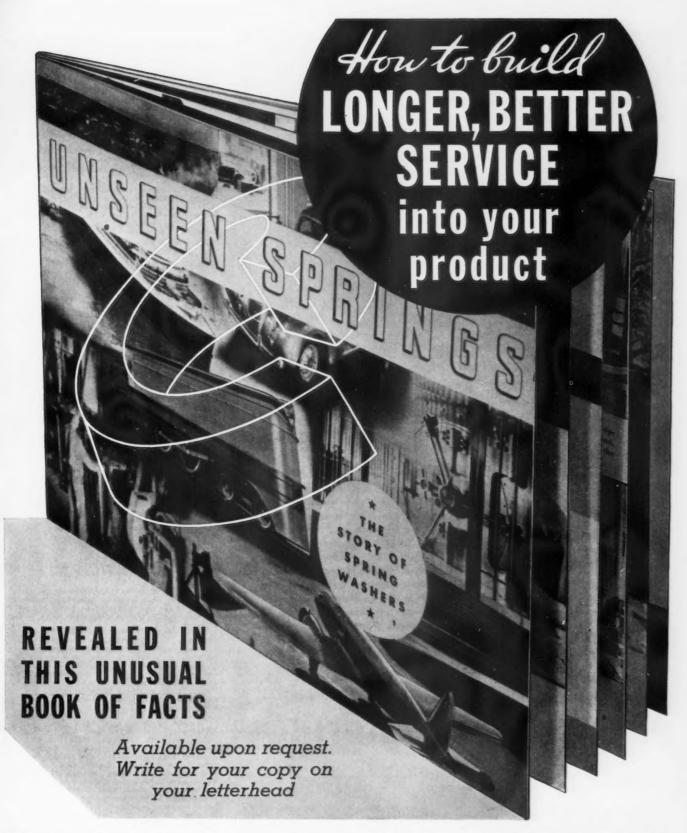
Commanding Officer, Ordnance Department, Frankford Arsenal, Philadelphia, asks bids until March 16 for 12 gages (Circular 353), 168,480 iron wood screws (Circular 369), 520 hard gilding metal rotating bands (Circular 350); until March 17, 29 gages (Circular 357); until March 19, 16 thread gages (Circulars 372 and 373), reworking 200,000 lb. lead scrap, scrap bullets and fired shells into 200,000 lb. lead antimony alloy for small-arms ammunition (Circular 371); until March 23, three after-coolers for compressed air system (Circular 352).

Supply Officer, Naval Aircraft Factory, Navy Yard, Philadelphia, asks bids until March 16 for nickel steel bolts (Aero Req. 989); until March 17, 24 engine assembly control lock controls, 150 airplane dash controls, complete with brass tubing, control wire, etc. (Aero Req. 859), nozzle filters for gasoline filling equipment (Aero Req. 1004); until March 18, steel clevis bolts (Aero Req. 985).

◀ NEW ENGLAND ▶

Bureau of Supplies and Accounts, Navy Department, Washington, asks bids until March 17 for 635 steel shells, pierced and welded; 635 similar shells, seamless drawn; 635 phosphor bronze shells, rolled and brazed or welded; and 635 similar bronze shells, seamless drawn for Newport, R. I., Navy Yard (Schedule 7402); until March 27, 13,128 aluminum cartridge tanks for Portsmouth, N. H., yard (Schedule 7409).

S. O. & C. Co., Ansonia, Conn., manufacturers of small brass goods, eyelets, washers, etc., have let general contract to H. Wales Lines Co., Meriden, Conn., for



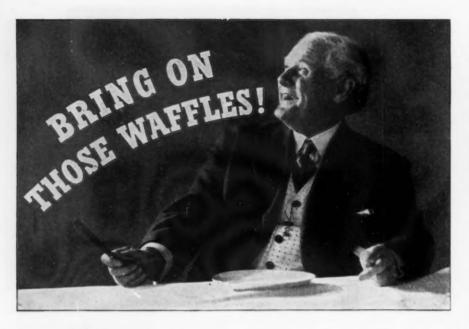
After months of research and preparation, this unusual book, "UNSEEN SPRINGS," is now available to all executives, engineers, designers, production managers and purchasing agents interested in building longer, better service into their products. It illustrates and explains Live Action . . . the plus feature of Spring Washers

that costs you nothing extra. Vividly portrays their service to others in *your* industry. Authentic. Concise. Complete. A book you will want to keep. Your copy is free for the asking. Have your secretary write for "UNSEEN SPRINGS".



SPRING WASHER INDUSTRY
616 WRIGLEY BUILDING ... CHICAGO, ILLINOIS

THE IRON AGE, March 12, 1936-115





Another Casting Problem

SOLVED BY PERMITE

Breakfast now means better, tastier waffles, easier to bake, because many appliance manufacturers have discovered the advantages of Permite Aluminum Alloy Castings . . . By changing to Permite, they gained for their appliances lighter weight, higher heat conductivity, fine

grain structure, freedom from hidden foundry defects, uniformity, an easier-to-clean, tarnish-resistant finish . . . Bring on your casting problem! In many different lines, manufacturers are learning that they can turn out better products at a saving in total costs by using Permite Aluminum Alloy Castings. Write today for details, or send blueprints for our recommendations and quotations. This places you under no obligation.

ALUMINUM INDUSTRIES, INC., Cincinnati, O. Branch Offices: Chicago, 616 S. Michigan Ave.... Detroit, 718 Fisher Bldg.

PERMITE CASTINGS

one-story additions, and improvements in present plant. Cost over \$40,000 with equipment. S. Firestone, 59 South Avenue, Rochester, N. Y., is architect and engineer.

United Illuminating Co., 128 Temple Street, New Haven, Conn., has arranged fund of about \$2,000,000 for extensions and improvements in plants and system, including new transmission and distributing lines. Expansion will be carried out at electric generating station at Steele Point, Bridgeport, Conn., with installation of new equipment.

Commanding Officer, Ordnance Department, Springfield Armory, Springfield, Mass., asks bids until March 17 for one hydraulic surface grinder, 10 x 36 in. (Circular 134), tooling and cams for automatic screw machine (Circular 153); until

March 18, three cylindrical universal hydraulic grinders (Circular 133), one self-fed, motor-driven, wood-working rip saw (Circular 138), 18,378 springs (Circular 163); until March 19, one single-drum, endless bed, wood-working sander (Circular 137), three motor-driven, ball-bearing hand planers and jointers (Circular 139); until March 23, one exhauster and 32 blast gates (Circular 143), two cylindrical, plain, hydraulic grinders, and one center pointing device (Circular 146); until March 20, one wood-working lathe (Circular 145).

■ BUFFALO DISTRICT **▶**

International Harvester Co., 606 South Michigan Avenue, Chicago, has let general contract to Dawson Brothers Construction Co., Inc., Union Building, Syracuse, N. Y., for one-story addition to factory branch, storage and distributing plant at Syracuse. Cost close to \$150,000 with equipment. Company will remove present branch at Auburn, N. Y., to new unit on completion, increasing present capacity.

United States Engineer Office, Federal Building, Buffalo, asks bids until March 16 for 34-in. wire rope (Circular 93).

Rochester Gas & Electric Corpn., 89 East Avenue, Rochester, N. Y., plans new steam-operated electric generating plant, on which work will begin early in spring. Cost about \$1,000,000 with turbo-generators and auxiliary equipment.

Trico Products Corpn., 817 Washington Street, Buffalo, manufacturer of automotive equipment and accessories, has let general contract to John W. Cowper Co., Inc., Rand Building, for five-story and basement addition. Cost over \$100,000 with equipment.

◆ WESTERN PA. DIST. ▶

Board of Education, Arnold, Pa., plans manual training department in new two-story junior and senior high school, for which bids will be asked on general contract soon. Cost about \$275,000. Thayer Co., Greer Building, New Castle, Pa., is architect.

Island Creek Coal Co., Huntington, W. Va., plans new steel tipple on Kanawah River, near coal-mining properties at Holden, W. Va., for loading barges for water transportation. Cost about \$80,000 with machinery.

Standard Ultramarine Co., Fifth Avenue and Twenty-first Street, Huntington, W. Va., manufacturer of industrial and other chemicals, has plans for four-story addition for storage and distribution. Cost close to \$40,000 with equipment.

Borough Council, Borough Hall, Warren, Pa., plans new municipal airport in West End district, including hangars with repair and reconditioning shops, oil storage and distributing building, administration building and other units. Cost about \$170,000. Proposed to begin work early in spring.

♦ SOUTHWEST ▶

Bureau of Supplies and Accounts, Navy Department, Washington, asks bids until March 24 for one motor-driven bench lathe for Kansas City station (Schedule 7401).

Department of Public Works, Kansas City, Mo., N. W. Hyland, assistant director, will soon take bids for underground equipment, repair, service and garage building, 200 x 250 ft., for municipal motor trucks, trailers and automobiles. Cost about \$500,000 with equipment. Wight & Wight, First National Bank Building, are architects; Erwin Pfuhl, Fairfax Building, is engineer.

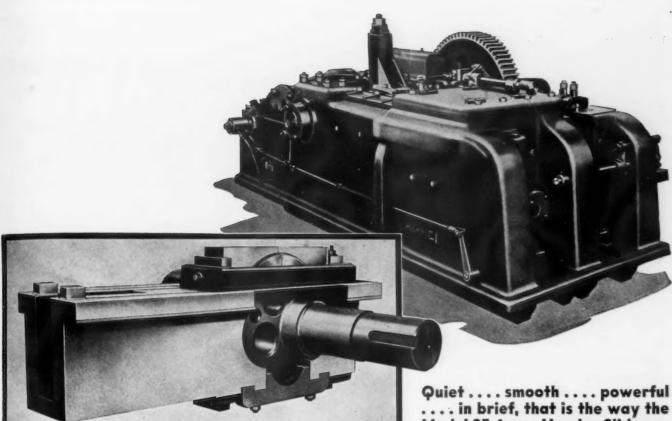
Crossett Lumber Co., Crossett, Ark., has let general contract to Rust Engineering Co., Pittsburgh, for new kraft pulp and paper mill on 20-acre tract near present plant of company. It will include digester house, screen house, beater department, causticizing plant, paper machine mill and finishing mill, with power house and other mechanical divisions. Cost \$4,000,000 with machinery. Financing in that amount has been arranged through RFC. Hardy S. Ferguson & Co., 200 Fifth Avenue, New York, are consulting engineers.

United States Engineer Office, Manufacturers' Exchange Building, Kansas City, Mo., asks bids until March 17 for about 87,400 lb. carbon steel castings and 10,400 lb. semi-steel castings (Circular 538).

Common Council, Thayer, Mo., is arranging bond issue of \$40,000 recently approved, for new municipal electric power plant. Cost about \$72,000, remainder of fund to be secured through Federal aid.

Frick-Reid Supply Corpn., 108 North Trenton Street, Tulsa, Okla., manufacturer of oil well equipment and supplies, has plans for new one-story factory branch, storage and distributing plant at Beau-

116-THE IRON AGE, March 12, 1936



SMOOTH Flowing POUER

Quiet smooth powerful in brief, that is the way the Model 35 Acme Header Slide operates. This eccentric powered header slide moves forward and back with the same smooth action in both directions. No up or down pressure on the slide accurate header tool alignment maintained constantly elimination of conventional Pitman construction are a few of the advantages of this eccentric design.

To you, these mean freedom from vibration maintained accuracy better forgings. This eccentric construction is but one of many modern developments exclusive to the new Acme Model 35 Forging Machine.

Pages 6 and 7 of the accompanying bulletin describe in detail this sliding head design, construction and operation. Write for a copy.

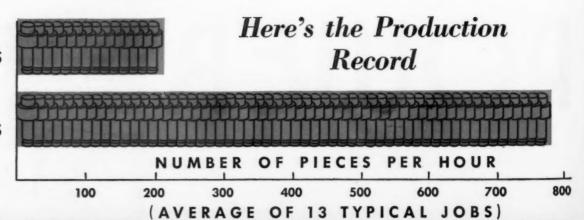
Acme also builds all Steel Hot Forged and Hot Pressed Nut Machines, Hammer Bolt Machines, Continuous Rivet and Bolt Machines, Bolt Threading Machines, Pointers, Nut Tappers—a complete line of bolt, nut and forging machinery.

THE ACME MACHINERY CO. CLEVELAND, OHIO, U.S.A.



OLD MACHINES

NEW MACHINES



Parts Produced

the

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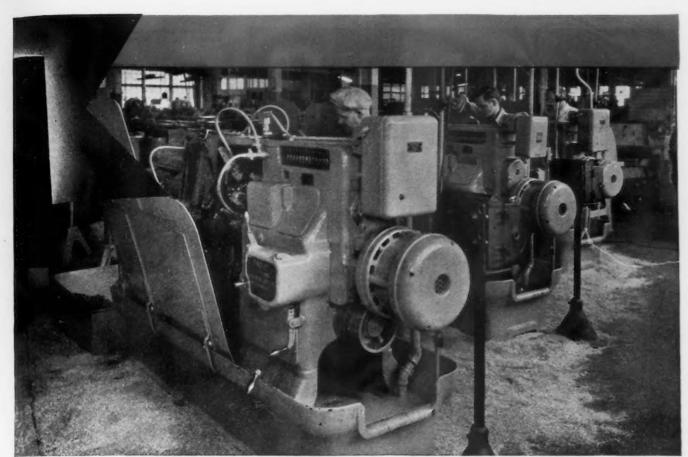
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Automatic Screw
Machines
Dies and Taps
Positive Centrifuges
The Chronolog
Contract Manufacturing

NATIONAL



The Hoover Company uses Chronologs to assure the greatest possible production.

The *Inquiring Reporter* Takes a Look at Parts Production at The Hoover Company

They turn out more than 200 different parts in the screw machine department of The Hoover Company, North Canton, Ohio. Accurate records show that production speeds of the National Acme Model R Automatic Screw Machines are two to three times that of old machines doing the same work. On certain parts speed is more than four times greater!

Other advantages reported are—a better finish on parts, reduced maintenance expense, and simplified supervision. Summed up, the management of The Hoover Company estimates that three additional Model R machines soon to be installed will render obsolete nine old-type machines now in operation.

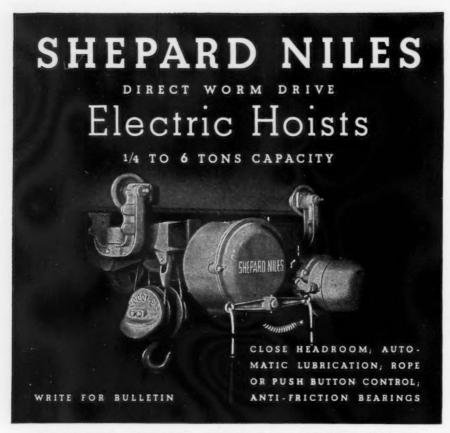
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Are you using obsolete screw machines? Our engineers will quickly show you whether new machines will pay their own way.

The National Acme Company, Cleveland, O.



ACME



SHEPARD NILES CRANE & HOIST CORP.

384 Schuyler Ave., Montour Falls, N. Y. . Export: 111 B'dway, N. Y. C.

MOST COMPREHENSIVE LINE OF CRANES & HOISTS

mont, Tex., 36 x 90 ft. Cost close to \$40,-000 with equipment.

Quartermaster Supply Office, Fort Sam Houston, Tex., asks bids until March 21 for vacuum drying ovens, filter pump, platinum crucibles, extraction equipment, muffle-type furnaces, electric heaters, kettles and other equipment (Circular 182).

■ WASHINGTON DIST. **▶**

Purchasing and Contracting Officer, Fort George G. Meade, Md., asks bids until March 18 for wrenches, pliers, screwdrivers, battery chargers, grinder for piston pin holes, hydraulic press, drill press, valve refacer and other tools (Circular 64).

Virginia Electric & Power Co., Richmond, Va., plans extensions and improvements in artificial gas plant at Norfolk, Va., including new steam boilers and other equipment. Cost about \$130,000. Company is also arranging for new transmission and distributing lines for both city and rural service, with power substation and service facilities. Cost about \$760,000.

Cecil County Board of Education, Elkton, Md., plans manual training department in new two-story high school at Calvert, Md., to replace structure recently destroyed by fire, for which bids are being asked on general contract. Cost over \$150,000. E. William Martin and Ralph A. Jeffers, duPont Building, Wilmington, Del., are architects.

General Purchasing Officer, Panama Canal, Washington, asks bids until March 19 for 10,000 lb. track spikes, six horizontal pumps, angle valves, globe valves, at valves, throttle valves, 4000 railway signal bonds, wire rope, copper cable, magnet wire, transformers, steam hose couplings, manganese bronze rods and other equipment (Schedule 3128).

Contracting Officer, Chief of Engineers, Munitions Building, Washington, asks bids until March 17 for one 8-ton and one 4-ton gasoline mechanical drive locomotives (Circular 20).

(Circular 20).

Bureau of Supplies and Accounts, Navy Department, Washington, asks bids until March 17 for 44 130 gal. per min, electric-operated portable submersible pumps, salt water at 30-ft. total head (Schedule 7367) for Sewall's Point, Va., Navy Yard; seamless steel tubing (Schedule 7349), valves, spare parts, tools and wrenches (Schedule 7342), one metal-forming machine (Schedule 7382), corrosion-resisting steel tubing (Schedule 7382) for Eastern and Western yards; until March 20, one motor-driven vertical shaper and slotter (Schedule 7404) for Philadelphia yard.

♦ SOUTH ATLANTIC ▶

Carolina Aniline & Extract Co., 1122 South Boulevard, Charlotte, N. C., has rejected bids recently received on general contract for new plant, and will ask new bids on revised plans soon. Cost about \$50,000 with equipment. Additional one-story units also will be built, entire plant to cost about \$150,000. M. R. Marsh, Builders' Building, is architect.

Bureau of Supplies and Accounts, Navy Department, Washington, asks bids until March 20 for one motor-driven cutting machine (Schedule 7397), and one electricoperated nibbling machine (Schedule 7399) for Charleston, S. C., Navy Yard.

Board of Aldermen, Rocky Mount, N. C., asks bids until March 19 for one 1050-hp., horizontal, cross drum, forged steel, sectional header watertube boiler with accessories, and one nine-retort underfeed stoker, complete with clinker grinder, ash hopper, combustion control equipment, etc., for

municipal power plant. William C. Olsen, Raleigh, N. C., is consulting engineer.

■ MICHIGAN DISTRICT

Petroleum Chemicals Co., Inc., Grand Haven, Mich., care of George H. Flynn, 2349 National Bank Building, Detroit, attorney and representative, recently organized with capital of \$1,000,000, has acquired 9-acre tract of waterfront property at first noted place, for plant for production of motor fuels, alcohol and kindred industrial chemicals. Cost over \$250,000 with equipment. Initial buildings are expected to be completed late in summer. G. J. Wagner & Co., Grand Rapids, Mich., are consulting engineers. W. J. McCartney will be general manager of new company.

Olds Motor Works, Inc., Lansing, Mich., a unit of General Motors Corpn., Detroit, has plans for three;story addition, 130 x 410 ft., for general engineering, car testing, etc. Cost close to \$200,000 with machinery. Superstructure will begin early next month. Albert Kahn, Inc., New Center Building, Detroit, is architect and engineer.

Chase Tool Co., Royal Oak, Mich., is considering extensions and improvements, including additional machinery. Cost over \$30,000

Ainsworth Mfg. Corpn., 2200 Franklin Street, Detroit, manufacturer of automotive stampings and kindred equipment, has asked bids on general contract for two additions, four-stories, 80 x 160 ft., and one-story, 110 x 200 ft. Cost over \$200,-000 with equipment. Albert Kahn, Inc., New Center Building, is architect and engineer.

■ MIDDLE WEST

Crane Co., 4100 South Kedzie Avenue, Chicago, manufacturer of plumbing equipment and supplies, has let general contract to B-W Construction Co., 307 North Michigan Avenue, for two-story addition to plant at 3306-8 West Forty-third Street, 40 x 80 ft. Cost about \$40,000 with equipment. William J. Clark, 836 South Michigan Avenue, is architect.

Rockford Screw Products Co., Ninth Street, Rockford, Ill., has let general contract to Linden & Sons, Inc., 1102 Tenth Street, for one-story addition, 95 x 120 ft. H. J. Eklund, 408 South Chicago Avenue, is architect.

City Council, Hutchinson, Minn., asks bids until March 18 for new municipal electric power plant, including equipment and distributing system. Bonds for \$250,000 have been approved. Buell & Winter Engineering Co., Insurance Building, Sloux City, Iowa, is consulting engineer.

Rahr Malting Co., Manitowoc, Wis., has approved plans for new malt mill at Shakopee, Minn., with storage tanks, power house, machine shop and other mechanical units. Cost about \$850,000 with machinery. It is understood that new plant will be operated by a subsidiary interest.

United States English

United States Engineer Office, Canal Park, Duluth, Minn., asks bids until March 17 for machine bolts and nuts, turnbuckles, tie rods, washers, round spikes and wire nails (Circular 18); until March 20, railroad track materials, including rails, standard splice bars and standard splice bar bolts for bolting of rails (Circular 20).

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Northwest Rural Electrification Co., a subsidiary of Montana-Dakota Power Co., 831 Second Avenue South, Minneapolis, Minn., plans new transmission and distributing lines in Golden Valley, Ward, Burke and other counties, N. D., and Fallon and Wibaux counties, Mont., totaling over 100 miles, with power substation and service facilities. Fund of \$146,000 has been arranged through Federal aid.

Pure Oil Co., 35 East Wacker Drive, Chicago, has let general contract to Lummus Co., 50 Church Street, New York, for addition to oil and gasoline refinery at Toledo, Ohio, increasing capacity to 20,000 bbl. daily. Cost about \$750,000 with equipment.

K. E. Fredericks, 820 East Mason Street, Milwaukee, has purchased business and equipment of Rhodes Metallic Packing Co.,

120-THE IRON AGE, March 12, 1936



MODERNIZATION THREADING A

The No. 11 Machine, cutting machine threads 1/4 to 11/2" and from 1/4 to I" pipe, comes in the Single and Double Head types.

The No. 22, a larger machine, cutting machine threads 1/2 to 21/2" and from 1/2 to 2" pipe, also is built in the Single and Double Head

Machines may be equipped to use Circular or Tangential type chasers.



All machines embody the following features:

- Pre-loaded roller bearings throughout.
 Motorized machines with motor placed in bed of machine.
 Speeds adjustable between 72 and 386 RPM.
 Lead Screws optional.

MURCHEY MACHINE & TOOL CO. DETROIT, MICHIGAN 951 PORTER STREET

Collapsible Taps, Self Opening Die Heads; Bolt Threading, Pipe Threading and Pipe Cutting Off Machinery.

Chicago, and has transferred production and headquarters to Cudahy, Milwaukee, where initial floor space of 2500 sq. ft. at 806 Packard Avenue has been leased. Roy A. Potts is general manager.

Wisconsin Motor Corpn., 1910 South Fifty-third Street, Milwaukee, is purchas-ing new equipment costing about \$50,000 for replacements and additional capacity for production of gasoline and oil engines.

Badger Machine Repair Co., 1215 North Eleventh Street, Sheboygan, Wis., has placed contract for addition, 30 x 60 ft., designed by E. A. Stubenrauch, local archi-

♦ SOUTH CENTRAL ▶

United States Engineer Office, Vicksburg, Miss., asks bids until March 27 for steel boiler tubes, 4-in. diameter, 11 ft., 7½-in. long (Circular 200); until March 28, eight three-blade bronze propellers, 35-in. diameter (Circular 201).

Globe Union Mfg. Co., East Keefe Avenue, Milwaukee, manufacturer of electric storage batteries and parts, has leased one-story building, 120 x 200 ft., to be erected on Mallory Riverside Boulevard, Memphis, Tenn., for new plant. Cost about \$60,000 with equipment. J. T. Wallace, Commerce Building, Memphis, is architect. Company is now occupying building at 305 West Trigg Street, Memphis.

Municipal Power Board, Chattanooga, Tenn., has authorized immediate plans for new electrical distributing lines, with transmission system and power substation facilities for high-tension service from TVA power lines. Fund of \$8,000,000 was voted several months ago and project has been held in abeyance since that time.

United States Engineer Office, First District, New Orleans, asks bids until March 16 for one forged steel crank shaft (Circular 224).

Board of Education, Jackson, Miss., plans manual training department in new three-story junior high school, for which general contract has just been let to W. J. McGee & Son. Cost about \$275,000. Financing has been arranged. N. W. Overstreet & Town, Jackson, are architects.

Director of Purchases, Tennessee Valley Authority, Knoxville, Tenn., asks bids until

March 20 for ventilating equipment and air-cooling machinery for new hydroelectric generating plant at Norris Dam, Tenn.

♦ OHIO AND INDIANA ▶

Chillicothe Paper Co., Chillicothe, Ohio, has let general contract to Austin Co., Cleveland, for three one-story additions, 60 x 108 ft., 80 x 100 ft., and 40 x 80 ft., including improvements in present plant. Cost close to \$100,000 with equipment.

Hoover Co., Canton, Ohio, manufacturer of vacuum cleaners and parts, has let general contract to Warren Hoffman Co., Mellett Building, for one-story addition to plant at North Canton. Cost over \$75,000 with equipment.

Board of Public Works, City Hall, To-ledo, Ohio, John N. Eddy, city manager, plans installation of new gas engine-elec-tric generator, with auxiliary equipment, at municipal sewage disposal works, to convert waste gas for electric power ser-vice. Cost about \$35,000.

McKinney Tool & Mfg. Co., 1688 Arabella Road, Cleveland, manufacturer of tools, stampings, dies, etc., has asked bids on general contract for one-story addition. Cost close to \$45,000 with equipment. Edward G. Hoeffler, 5005 Euclid Avenue, is architect and engineer.

Matz Brewing Co., Inc., Bellaire, Ohio, will carry out extensions and improvements in former plant of Bellaire Brewing Co., recently acquired, including considerable new equipment. Cost close to \$50,000 with machinery.

City Council, Elyria, Ohio, is considering installation of new Diesel engine-generator unit and accessory equipment at municipal sewage disposal works for electric power

service.

Contracting Officer, Material Division, Air Corps, Wright Field, Dayton, Ohio, asks bids until March 16 for electric drills (Circular 606), five electric drill grinders and three motor-driven knife grinders (Circular 604); until March 19, 200 bomb release handle assemblies (Circular 620); until March 20, steel wool (Circular 620); until March 20, steel wool (Circular 626), 750 aileron control cable anchors and 60 centrifuge chamber support brackets (Circular 632); until March 24, steel cotter pins and taper pins (Circular 634); until March 25, 29 instrument bench test fix-

ture assemblies, two turntable assemblies, eight vacuum pump-testing equipments, etc. (Circular 609).

E. Rauh & Sons Fertilizer Co., Union Stock Yards, Indianapolis, manufacturer of commercial fertilizers, plans rebuilding part of plant, recently destroyed by fire. Loss close to \$100,000 with equipment.

Contracting Officer, Quartermaster Corps, Jeffersonville, Ind., asks bids until March 16 for one ½-cu. yd. power shovel, one crane, 35 ft., and for one ¾-cu. yd. drag-lipe bucket (Circular 202).

♦ PACIFIC COAST ▶

Water and Power Bureau, 207 South Broadway, Los Angeles, D. P. Nicklin, pur-chasing agent, asks bids until March 18 for one 300 kw. motor-generator set with accessories (Specifications 1885).

Tri-State Valley Packing Association, San Jose, Cal., fruit packer and canner, with plants at San Jose and Modesto, Cal., has arranged for Federal loan in amount of \$245,000 for expansion, including purchase of canneries and installation of additional equipment, including conveying, loading and other mechanical-handling continued. equipment.

Board of Trustees, University of Utah, Salt Lake City, Utah, plans extensions and improvements in steam power house used for central heating, including additional equipment. Fund of \$35,700 has been arranged through Federal aid.

Waterside Milling Co., Tacoma, Wash., W. H. Foster, president, has leased water-front property as site for new grain mill and elevator, to replace unit recently destroyed by fire. Cost about \$75,000 with conveying, elevating, screening and other equipment. equipment.

Purchasing and Contracting Office, United States Army, Fort Lewis, Wash. asks bids until March 16 for one deep-well pump and accessories (Circular 75).

Board of Education, Riverside, Cal., will, Board of Education, Riverside, Cal., will, soon take bids on general contract for one-story manual training shop at Chemawa junior high school, to cost \$42,000 with equipment. John C. Austin and Frederic M. Ashley, Chamber of Commerce Building, Los Angeles, are architects.

Bureau of Supplies and Accounts, Navy Department, Washington, asks bids until March 17 for carbon and high-speed twist drills (Schedule 7327), boiler-water testdrills (Schedule 7327), boiler-water testing equipment and spare parts (Schedule 7338); until March 20, electric insulators (Schedule 7343) for Mare Island Navy Yard; for four air-operated mold jarring machines (Schedule 7370), one portable spot welder (Schedule 7363), two motor-driven roller pipe-cutting machines (Schedule 7369), one toolmaker's lathe (Schedule 7373) for Puget Sound yard; one hydraulic arbor press (Schedule 7350) for San Diego yard.

♦ FOREIGN ▶

Magnesium Elektron, Ltd., Clifton, near Manchester, Lancashire, England, affiliated with F. A. Hughes & Co., Ltd., Manchester, has taken over property at first noted place for production of magnesium metals and alloys under electrolytic process. Existing buildings will be remodeled, and new units constructed. Plant will give employment to about 300 operatives and is expected to be ready for service next fall. Cost over \$250,000 with machinery.

British Oxygen Co., Ltd., London, England, and Fort William, Scotland, plans new electro-chemical works at last noted place, to include machine shop, pumping station and other mechanical departments. Cost over \$800,000 with machinery.

Hobart Municipal Tramways, Hobart Tasmania, asks bids until April 20 for one electric rotary converter and auxiliary equipment for power station.

Fisher & Ludlow, Ltd., Birmingham, land, manufacturer of tools and allied equipment, has acquired site for new plant for manufacture of presses, parts, etc., for metal stampings for automobile bodies and kindred service, scheduled for completion late in fall. Cost over \$200,000 with machinery.

"SMALL PART" FORMERLY COST $2\frac{1}{2}^{c}$ NOW $\frac{7}{8}^{c}$

♠ A large motor car manufacturer used a considerable number of "small parts" of an intricate type in each automobile. Hotforged and machined they cost 2½c. each. His engineers and Manville's went into a huddle. Result: the "small part" costs %c. now. It is cold-forged on a Manville Heading Machine.

vill for wa ith eric ild-

Manville Cold-Processing is saving millions of dollars yearly in the manufacture of small parts, rivets, bolts, nuts, etc. Manville cold-forging largely eliminates metal wastage as well as saving machining. In the past 5 years, Manville engineers have tackled and solved many a new problem. They will be glad to tell you whether you can cold-forge some article you are now hot-forging and cut costs accordingly.

It is well to remember that Manville has been the quality name in cold-forging machinery since the infancy of the art. Headers, Re-headers, Thread Rollers, Slotting Machines and Presses by Manville get the work out fast, economically and reliably. Your inquiry will receive prompt attention.

MANVILLE MACHINES

E. J. Manville Machine Company, Waterbury, Conn.
CLEVELAND OFFICE: 1209 SWETLAND BUILDING



"GUSHER"

COOLANT PUMPS-

Will please you because of their utmost simplicity, rigidity and the absence of packing glands or the equivalent. There are no metal-to-metal contacts within the Pump, and absolutely no adjustments are required. The Pump shaft is an extension of the Motor shaft which revolves on two high grade ball bearings sealed within the Motor end flanges.

Before you buy another Coolant Pump, write for our prices and data.

THE RUTHMAN MACHINERY COMPANY CINCINNATI, OHIO, U. S. A.

Industrial Truck for Millwright Use

NEW model high-lift industrial truck especially designed for millwright use, for moving and setting heavy machinery and similar purposes, has been developed by Mercury Mfg. Co., 4100 South Halsted Street, Chicago. A double drum motor driven winch is mounted above the battery com-

partment. This winch has a capacity of 4000 lb., and cable sheaves are provided for convenient handling of any type of equipment to be moved. The truck is a 6000-lb. capacity high-lift model, equipped with 4-wheel trailing axle, vertical wheel steering, and with winch motor controller, and ampere-hour meter mounted above the battery compartment. Design includes features of hydraulic lift, double-reduction bevel and spur gear drive axle, magnetic contac-



124-THE IRON AGE, March 12, 1936

tor control, safety brakes in the wheels, ball bearings throughout, semi-elliptic spring suspension, and positive and automatic overload protection.

Drill Grinder Employs Separate Holding Jig

NEW twist drill grinder by the Oliver Instrument Co., Adrian, Mich., consists of a bench base, inclosing a motor and supporting a grinding wheel bearing and a carriage. The carriage has a bearing which supports a graduated arc and holding fixture.

The jig is entirely independent of the machine and consists of a pair of jaws for drill clamping and a gage for drill setting. After the drill is set, the jig is placed in the holding fixture and one lip is ground, the jig is then reversed for griding the second lip. Adaptability is for right or left hand drills, or thick-web type oil hole drills. Capacity 3/32 to ½-in. drills without collets; with collets 3/32 in. to No. 57 drill.

Dial Switch Control For Arc Welder

NEW dial switch control for use with electric welding outfits is announced by the Miller Electric Mfg. Co., Appleton, Wis., manufacturers of "Wonder" Arc welders. The device is said to be so designed that it cannot short the electrical current between contacts. As an added factor of safety, the switch dial must be in correct position before the welder can be operated. Amperage indicating each step in welding is marked in figures. Operation requires only that the dial be properly set at figures which give the operator control of amperage.

E. W. Bushman Co., Inc., Cincinnati, conveyor and industrial equipment engineer, has concluded negotiations for a long term lease on the building at 418-422 New Street. This move will increase its facilities for wider engineering activities and also for fabrication of materials for conveying systems. Company is distributer for Link-Belt products and plans to carry a more extensive stock of this company's lines.

Ericsson Screw Machine Products Co., Inc., Brooklyn, now celebrating its 25th anniversary, is moving into new and larger quarters and will occupy about 11,500 ft. of floor space at 25 Lafayette Street. E. W. Ericsson is president, A. W. Ericsson, vice-president; Victor Osting, treasurer; and W. S. Bell, secretary.

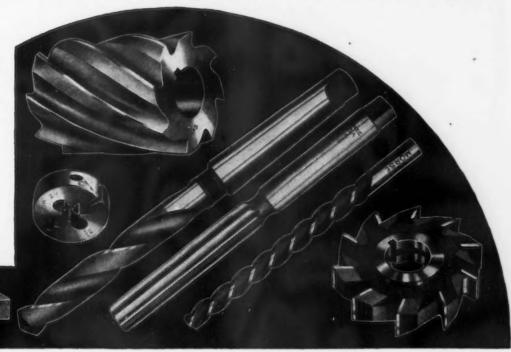


THE PIECE-WORKER KNOWS THERE IS A DIFFERENCE

THE MORSE LINE

Includes

High Speed and Carbon CUTTERS TAPS and DIES REAMERS, DRILLS SCREW PLATES ARBORS, CHUCKS COUNTERBORES MANDRELS TAPER PINS SOCKETS, SLEEVES



One of the greatest unofficial testers of small tools is the piece-worker. His pay envelope is a reliable indicator of how well the cutting tool is standing up—how rapidly and economically it is performing.

Piece-workers know that there is a difference in small tools. The fact that they so frequently insist on Morse Tools is one of the sincerest tributes which industry can pay to Morse quality. It is proof positive that you can count on steady production, fewer delays, longer working life from Morse cutters, reamers, drills, taps and dies.

There is a Morse Distributor convenient to you TWIST DRILL & MACHINE COMPANY NEW BEDFORD - - - MASS., U. S. A.

NEW YORK STORE: 130 LAFAYETTE STREET - - CHICAGO STORE: 570 WEST RANDOLPH STREET



FORGINGS



N.F.& O.Basic Electric Steel produced under rigid metallurgical control is an important quality factor in the ultimate forged product

BASIC ELECTRIC STEEL

Carbon, Alloy, Corrosion Resistant and Special Steels Smooth Forged, Hollow Bored, Rough or Finish Machined, Heat Treated to Specifications ... Forging Quality Ingots, Pressed or Hammered Billets.

NATIONAL FORGE AND ORDNANCE COMPANY

IRVINE, WARREN COUNTY, PENNA.

Saws and Saw Tools .- E. C. Atkins & Co... 406 South Illinois Street, Indianapolis. General catalog No. 21, 150 pages, with descriptive data, specifications and illustrations of a wide variety of saws, saw tools, machine knives and files. The section devoted to metal-cutting saws includes circular metal milling saws, hole saws, hack saw blades and machines, band saw blades and machines, hacksaw frames, and hand saws. Other sections cover tools for the filing room, and circular, band, crosscut and a number of other saws. A comprehensive telegraphic code is included. The volume is attractively bound in blue and gold, and is comprehensively indexed for ready reference.

Going Up!

(CONTINUED FROM PAGE 45)

32 per cent of the railroads, 58 per cent of the telephone and telegraph facilities, 76 per cent of the automobiles, and 44 per cent of the radio receiving sets. These facts show that we enjoy more comforts and conveniences than any other nation on the face of the earth."

What Is Behind It All?

What are the active forces, whose operation has produced all these comforts and conveniences for a nation?

Men, of course—men with the brains, initiative and enterprise, which compel them to start a business of their own, whether it is a service station or a department store, a steel mill or a toy-shop. They are the men who think up the things to do and to make and who then set about creating a mass demand for their offerings, whether they are low-priced cars, frosted foods or air-conditioners.

This superiority of brains and energy is not limited to ten men or a hundred or a thousand. There are literally hundreds of thousands of able leaders in every industry, business and profession in this country, who have inaugurated successful enterprises based upon their ideas and given employment to millions and the necessities and comforts of life to millions more.

The people, please note, do not originate the demand for new goods but they are highly susceptible to advertising and all forms of sales effort. They are trained, so to speak, to want the latest and best for their families and themselves. They welcome the useful, the amusing, the novel because they, too, are ambitious. These possessions mark their upward progress in the world, just as the creation of them marked the advancement of the inventor, the maker and the merchant. Taking it all in all, this spirit of getting on is the soul of the American System of Enterprise-the spirit which has made America the leader of the world in human achievement.

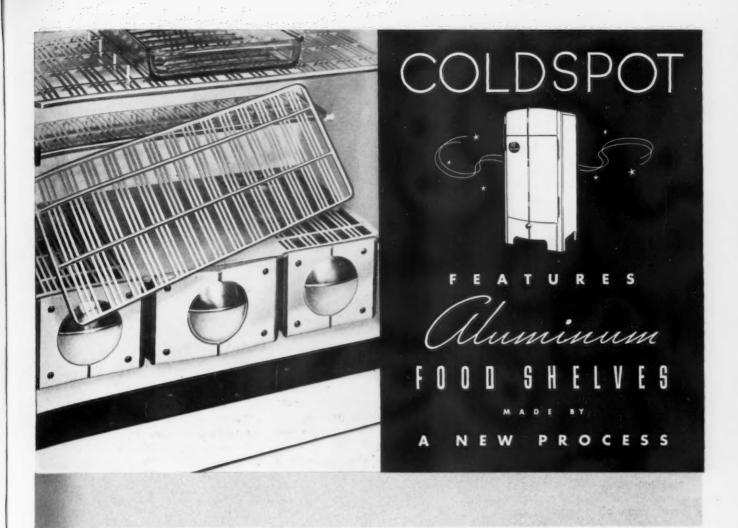
"Industry is, of necessity, the motivating force behind social advancement," says Mr. Hook. "No one knows better than the industrialist that the continued prosperity and progress of the nation depends not upon maintaining but upon increasing the standard of living of all the people, for the higher that standard rises the greater becomes the demand for the produce of industry.

"Large volume production is so organized that it cannot profitably serve the few. It must always serve the masses. There is no escape from this principle. Industry must always strive for improved articles at still lower costs, so that a greater number of the people can afford to purchase. Where are the expensive cars, refrigerators, radios, and other highpriced products of yesterday? In their place have come low-cost, improved products which the average man can afford. It is not unusual for the president of the company and the millwright to drive the same kind of car, and own the same type of radio these days."

We Want More

So our standard of living has been high and growing higher because people eagerly absorb all the new goods, which comfort or amuse, as they spring from the teeming brains and humming machines of their producers. There is a sort of compulsion, which rests upon the one to produce and the other to consume. The urge to buy is so much the stronger because the producer of one kind of goods is a consumer of many others. He wants the latest models just as much as he presses his own upon the public.

This applies not only to the things he buys for his personal use or that of his family, but to the equipment and surroundings of his business. He wants a daylight factory, plenty of fresh paint, new and efficient machines. Besides, he wants his working force to have clean wash and locker rooms and, often, lunch and rest quarters. It is in his makeup to be proud of his establishment. So he makes it something to be proud of-which raises the standard of living for the people who work in his plant or business for, after all, they do



The new 1936 COLDSPOT electric refrigerators now being announced by Sears, Roebuck and Co. contain many striking features of operation and convenience.

None is more striking than the new shelving of Alcoa Aluminum. This exclusive feature, a joint development of Hoosier Lamp & Stamping Corp. and Aluminum Company of America, takes both practical and merchandising advantage of the unique characteristics of Aluminum, and presents them to COLDSPOT buyers in a form that represents a great advance both in design and in manufacturing technique.

These shelves are easily fabricated being stamped and perforated from sheets of Alcoa Aluminum, as a part of which the heavy reinforcing bars are *rolled integrally*. A patent

covering this distinct technical achievement has been applied for.

The user gets lightweight, one-piece shelves made from the metal that is Friendly to Food and finished by the Alumilite process. Never will there be rusting or corrosion. There are no crevices where dirt may lodge. Dishes and bottles cannot tilt, because of the flat surface. And there is plenty of free area for air-circulation.

This is one more example wherein the designer with an eye to merchandising, capitalizes the natural advantages of Alcoa Aluminum, and achieves his goal by utilizing the technical co-operation of this organization. We extend similar co-operation to you. ALUMINUM COMPANY OF AMERICA, 2185 Gulf Building, Pittsburgh, Pennsylvania.



ALCOA · ALUMINUM

spend a good part of their lives there.

And what of the future? Is the standard going still higher? Answering with another question: Has anything fundamental in the American character changed in the past six years? It would not seem so. Of course we have had to deprive ourselves of a great many things we wanted but that seems only to have made us more avid for them. As soon as we can afford them again, we shall buy them.

Cars Lead the Procession

The motor-car has come to be the symbol of American living. Car production in 1935 has recovered to a total almost as great as in 1928. Some of the buying is traceable to the payment of Federal agricultural credits and other releases of national funds, but whatever the cause, it is apparent that the compulsion to buy the refinements of living is as strong as ever. The radio industry, too, shows a gain in 1935 of 23.5 per cent over the same period in the previous year. The volume and class of Christmas shopping was another indication of the readiness of the American people to resume living at its former standard upon the slightest encouragement, whether mental, moral or financial.

It needs only the further encouragement of a wise governmental policy toward business to start us on a cycle of producing new goods and of purchasing by a far greater percentage of the whole people. That means low-cost production in much greater quantities than ever of goods everybody can afford.

And this is the key to a future for all the American people, which shall be fully as prosperous as the past with fewer and milder fluctuations. The methods of quantity production—or call it rather efficient production—must be intensified. They must be made still more efficient and must be applied to the manufacture of commodities to which they have never been applied before, including those which did not exist before—new ideas, new inventions.

Factory-produced houses, for example, are, as Mr. Hook pointed out, an expected development of the near future. There have been many types of precast, prefabricated, metal frame and assembled

wooden houses but they all had a limited vogue largely because each was designed to exploit some special material or some kind of service unit. Plans are now being developed for houses, whose walls, floors, partitions and roofs consist of steel panels and light shapes, insulated, painted and ready to erect. With careful attention to variety and excellence of design and proper promotional effort, something of this kind may well revolutionize home building. Indeed it could be extended to include multi-family houses as well.

Extending the Buying Circle

Then there is much to be done in the way of bringing labor-saving devices within the reach of the great mass of people at the base of the income pyramid by reducing the cost of production and the cost of electric power. Both would follow increased volume in any event but they will have to precede it if these facilities are to reach the families in the lower brackets.

There were roughly five million

families, each, in the income groups (a) \$0 to \$1,000; (b) \$1,000 to \$1,500; (c) \$1,500 to \$2,000; (d) \$2,000 to \$3,000. There were 2,400,000 in the \$3,000 to \$4,000 group and 1,200,000 in the \$4,000 to \$5,000 group.

The last two groups have always furnished the principal volume of buying of cars, radios, appliances, etc. But look at the potential buying power in the next lower groups. It can be made effective in either of two ways: (a) Increase their incomes or (b) lower prices. Who can doubt that their buying power will be increased by both means in the immediate future? For intelligent industry and business will both see to it that they increase sales volume by lowering costs, which, in turn, increases the total wealth, the total amount of money and credit in circulation and hence the incomes of the workers in the lower brackets.

The conclusion is inescapable that as long as the spirit of our American System of Enterprise continues to flourish, the standard of living will continue to go up.

New Trade Publications

Boilers.—E. Keeler Co., Williamsport, Pa. Bulletin; "CP" water tube boilers. Introduces 12 features of design. Describes and illustrates construction and operation. Diagrams the application of different types of stokers.

Fibre Containers. — Continental-Diamond Fibre Co., Newark, Del. Catalog. Boxes, trucks, cans, barrels, baskets and trays for industrial use. Illustrations are in colors and each type of equipment is described in detail as to construction and usage.

Motors.—Wagner Electric Corpn., 6400 Plymouth Avenue, St. Louis, Mo. Bulletin. Service instructions for capacitor-start induction-run motors. Detailed information and diagrams presenting, in column form, service problems, probable causes and remedies.

Floor Maintenance.—Flexrock Co., 800 North Delaware Avenue, Philadelphia, Pa. Bulletin. Announces "Concretedense" as an impenetrable concrete for both construction and maintenance purposes. Features availability for floor maintenance.

Building Materials. Austin Co., Cleveland. Fourth edition of booklet prepared by engineers comparing advantages and disadvantages of multi-story and single story buildings.

Expansion Bolts. Rawlplug Co., Inc., 98 Lafayette Street, New York. Loose leaf booklet, sized and punched to fit

standard engineering and architectural binders, containing charts, tables, data, specifications, etc. Illustrates various materials in which anchors are used and proper type anchors for each.

Silent Chain Drive. Link-Belt Co., Indianapolis, is distributing new booklet, No. 1725, on Silverstreak silent chain drives obtainable from stocks carried at company's warehouses and by authorized distributors.

Surface and Needle Pyrometers. Pyrometer Instrument Co., 103 Lafayette Street, New York. Illustrated bulletin No. 60A describing new set of combination surface and needle pyrometers for use in die casting, plastic molding, rubber processing, paper, textile, electrical metallurgical, glass, pottery and many other industries.

Tool Salvaging.—Eastern Cutter Salvage Corpn., 30 Littleton Avenue, Newark, N. J. Catalog A, 40 pages, illustrating various types of high-speed steel tools that are recut without annealing, and pneumatic tools that are rebuilt to standard size by applying hard chrome. Worn out plain mills are changed to alternate tooth type and milling cutters with standard angular teeth are converted to cutters having reinforced undercut teeth. End mills and files are recut, reamers and drills are reduced to specified sizes, and drills are retanged. Pneumatic tool parts restored to standard size include those of riveting hammers, chipping hammers, rammers and other pneumatic tools.